

THESIS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

# Rethinking Injury Events

Explorations in Spatial Aspects  
and Situational Prevention Strategies

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Rethinking Injury Events. Explorations in Spatial Aspects and Situational  
Prevention Strategies

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## ABSTRACT

This dissertation employs a holistic approach to injuries in everyday settings. It examines spatial aspects of adolescents' injury events in residential situations, school situations, and suicidal situations, seeking to throw light on any reciprocal influence between situated activity and the physical environment in such events. Thus far, research has generally neglected to pay sufficient attention to everyday injuries and the more mundane sites where they occur. Previous studies on the topic have, moreover, been predominantly mono-disciplinary. Due to the complexity of injury research more broadly and injury prevention more specifically, this dissertation makes a conscious effort to go beyond such limitations. Applying an interdisciplinary and transdisciplinary focus, it also aims to contribute to research on social sustainability more in general.

The more theoretical aspects of the research are geared to providing a better understanding of injury events as something explicable and situated, that is to say, as neither random nor unpreventable. Towards this end, core concepts of architectural research are brought to bear on the interrelationship between *humans*, *objects*, and *contexts* (cf. Love, 2002), defined for the purposes of this dissertation as *socio-spatial practice*. From this perspective, injury events are then looked at as something resulting from the convergence of factors addressed by the key concepts just named, as something caused by elements traceable to routine or situational activities (cf. Cohen & Felson, 1979; Wikström, 2011). Analysing injury events within this conceptual framework, the causal mechanisms and emergent processes behind injury events can be not only identified, but also prevented, through the use of *situational prevention strategies*. What this implies is the translation of, mainly, the Crime Prevention through Environmental Design (CPTED) approach into Injury Prevention through Environmental Design (IPTED). The research here is conducted using a mixed-method approach producing qualitative findings and quantitative data, so as to bridge the gap between the “how” and the “why” (cf. Clarke et al., 2015:13f.; Katz, 2001).

The results put forth in this dissertation suggest situational prevention specifically aimed at spatial aspects to be a promising approach to injury prevention, having the capability to reduce the occurrence of injury events. In private residential settings, however, the strategy showed itself to be more limited in its efficiency, being more effective when applied in semi-private settings such as building entrances/ lobbies. A still more effective context for it was found to be institutional settings: in them the spatial aspect appeared to be of great importance in relation to injury situations and the degree of visibility. In schools, for instance, the results pointed out to a close relationship between the injury situation, the spatial organization, and the social organization. In such settings, certain injuries tended to cluster spatially due to the organization of day-to-day activities. Finally, the results suggest that also suicides and suicide attempts in semi-public and public spaces could be significantly reduced through carefully thought-out environmental interventions. At the same time, there remains a need for further analysis of the events and places involved in suicides and their attempts, to fully understand who commit them in these settings and why.

**KEYWORDS:** adolescents, injury events, residential settings, situational prevention strategies, situations



## PREFACE

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This doctoral dissertation research started in September 2014, as part of the research project ArchSafe at the Department of Architecture and Civil Engineering, Chalmers University of Technology. Both the ArchSafe project on the whole and this research work were funded by the Swedish Civil Contingencies Agency. The aim of the two was to study injury events in residential areas with a focus on the possible development of prevention strategies related to the built environment. The ArchSafe project participants represent three different academic fields and departments in the city of Gothenburg: Robert Ekman and Inga Malmqvist came from the Department of Architecture and Civil Engineering, Chalmers University of Technology; Hans Ekbrand the University of Gothenburg's Department of Sociology and Work Sciences; and Björn Andersson and Jörgen Lundälv the same university's Department of Social Work.

Even if traditional architectural research in general centres on objects or facilities, this dissertation research concentrated on adolescents' everyday risks and injury situations. The main theme in it, even where it may not always be immediately obvious, is adolescents' interaction with the built environment in their everyday life. This interaction is of interest not only for anyone engaged in prevention strategy formulation, but also from the point of view of the theoretical and methodological development of the field. Accordingly, this dissertation aspires not only to rethink prevention strategies based on the findings described, but also push theory and methodology development further in light of their significance. The results of this work should, however, be understood as no more than a first attempt to create a more systematic and solid framework for socio-spatial analysis of everyday injury risk situations and events based on a transdisciplinary research approach. The present work, in other words, is not only itself a product of collaboration; it also represents an outcome of an on-going process of collegial collaboration and knowledge production, one which continues to move forward even after its publication, with dimensions both inside and outside the academia.

The research work presented in Papers I through III was carried out in close connection with the ArchSafe project; the papers were co-authored by project group members. The main focus in these three papers was on injury events occurring in residential settings. In them, these settings included both private residences and residential institutions, with the injury events involving mainly indoors injuries. As appears from the papers, adolescents are a risk group for injuries that has a slightly different injury pattern compared to older age groups.

The next three papers, Papers IV through VI, attempt to integrate aspects and places of importance for adolescences injury events. Papers IV and V focus on injury risks in schools – an important topic even in itself, as school attendance is obligatory everyday activity and that for so many. In Sweden, schools have also been, and certainly were at the time of this writing, a hotly debated topic, with discussions often revolving around political demands for accelerated securitization of schools. This politicization of the 'risks in schools' may, however, turn out to be ultimately not only ineffective, but also outright counterproductive. Any countermeasures, in their case, need to be developed based on probabilistic risks and not socially constructed risks.

Paper VI then takes up the issue of suicidal situations, in light of the fact that suicide continues to be a common cause of death for adolescents. Four individuals, on average, commit suicide each day, with one in every ten suicides being committed by a person under 25. The paper emphasizes external elements in suicides, the main one of which is, in it, defined as place. As the paper concludes, place-based countermeasures are a promising way to prevent at least certain categories of suicide, although mainly for adolescents only.

Writing this dissertation has been inspiring, challenging, enlightening, and, first and foremost, a privilege. The last aspect has to do with not only the fact of actually getting paid to read, think, and write (something we academics tend to do anyway), but also the distinct pleasure one derives from working closely with a group of inspirational colleagues. Even if I am the sole author of this dissertation, it could only come to being thanks to an opportunity I had to collaborate with several persons, all equally important for the quality of my research and my ability to complete my undertaking. While it is virtually impossible to list all of those supporting me throughout my project's duration, a few nevertheless need to be mentioned.

First and foremost, I would like to thank all those participating in the interviews for this research and in the research circles and workshops during its course. You offered me unique insights through the experiences you shared from the field, and our ensuing discussions helped to shape my work. A special thanks here also goes to my examiner, Professor Sten Gromark, along with my supervisors and all the members of the ArchSafe project group: all of you provided valuable help to me through your constructive feedback, stimulating commentary, and always ready guidance. Similarly, I want to thank Linda and Jenny at MSB for their support along the way.

In addition, I am grateful for the opportunities availed to me to engage in various research collaborations at AIDAH, CVA, and CBA at Chalmers University of Technology, at URBSEC at the University of Gothenburg, and through the Safe Place Network at KTH. These relationships, quite critically for my work, allowed me to network beyond the boundaries of my own academic discipline, supporting me in my quest to first identify and articulate and then pursue my own path in research.

I would, furthermore, like to thank all my colleagues and doctoral students at the Chalmers University's Division for Building Design, for the many interesting discussions we have had together. I hope they were an equal inspiration to you and your research as well, something that can help us all to develop our interests further. Additionally, I want to thank my former colleagues and new acquaintances in the Department of Sociology and Work Science and the Department of Social Work at the University of Gothenburg, and at the Institute of Health and Care Sciences at the Sahlgrenska Academy in Gothenburg. Special thanks are due to Professor Sven-Åke Lindgren for encouraging me to apply for my doctoral position in 2014.

Last but not least, I would like to thank my family and friends for their endless and unconditional support, especially my sons Love and Eldar, who have been very understanding and patient with my long hours away from them.

Gothenburg, October 2018.

## LIST OF PAPERS

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The dissertation is based on the work contained in the following papers:

**PAPER I:**

Thodelius, C., Ekman, R., Lundälv, J., & Ekbrand, H. (2017). Injury Events Sustained in Residential Environments: Age and Disability as Explanatory Factors for Differences in Injury Patterns in Sweden. *Housing & Society* 44(1–2): 127–40. <https://doi.org/10.1080/08882746.2017.1393284>

**PAPER II:**

Ekbrand, H., Ekman, R., Thodelius, C., & Möller, M. (2018). Fall-Related Injuries for Three Age Groups: Analysis of Register Data from Sweden. (Submitted to *Journal of Safety Research*.)

**PAPER III:**

Thodelius, C., Andersson, B., Lundälv, J., & Malmqvist, I. (2017). Injury Prevention in Institutional Settings in Sweden. In: Mathiasen, N. & Frandsen, A.K. (eds), *ARCH17: 3rd International Conference on Architecture, Research, Care and Health: Conference Proceedings*, pp. 135–49. Lyngby: Polyteknisk forlag.

**PAPER IV:**

Thodelius, C. (2018). Can Architecture Reduce Deviance in Schools? A Meta-Synthesis of Hot Spots in Swedish Schools. (Submitted to *Nordic Journal of Architectural Research*.)

**PAPER V:**

Thodelius, C. & Sandén, H.-O. (2017). Lethal School Violence in Scandinavia: Development of an Incident Typology and Suggestions for Prevention. *Journal of Risk Research*, <http://dx.doi.org/10.1080/13669877.2017.1378253>

**PAPER VI:**

Thodelius, C. (2018). A Place to Die: New Perspectives on Preventive Work in Adolescent Suicide (Book chapter accepted for Rice, L., Meraz, F., & Jones, M. [eds], *Designing for Wellbeing: Home, City, Society*. Faringdon: Libri.)

I would like to thank my co-authors and note the following about their contribution to the above articles:

**Paper I:** Hans Ekbrand contributed to the methodological framework and assisted with the statistical analysis; Robert Ekman helped with the interpretation of the results; Jörgen Lundälv contributed to the literature review and helped structure the sections about the law and regulations in Sweden.

**Paper II:** Hans Ekbrand contributed to the methodological framework and assisted with the statistical analysis; Robert Ekman helped with the literature review, data collection, and the interpretation of the results; Michael Möller helped with the interpretation of the results and contributed his expertise in the field of fractures.

**Paper III:** Björn Andersson helped with the structuring and interpretation of the analysis in general; Jörgen Lundälv helped structure the sections about the law and regulations in Sweden while also performing the analysis of injuries in institutions on the part of individuals with disabilities, impairments, or chronic illness; Inga Malmqvist contributed to the analysis of elderly people's injuries in institutional setting while helping to summarize previous research on elderly people's situation in Sweden and on prevention strategies for this particular group.

**Paper V:** Hans-Olof Sandén assisted with data collection, the interpretation of the results, and the structuring of the discussion.

## ADDITIONAL PUBLICATIONS AND PRESENTATIONS

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### LICENTIATE THESIS

Thodelius, C. (2016). *Risker och rum. Riskmiljöer och riskfaktorer för barn och ungas skadehändelser i hem- och boendemiljön*. Chalmers University of Technology, Gothenburg.

### PEER-REVIEWED JOURNAL PUBLICATIONS

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Thodelius, C. & Lundälv, J. (2017). Från omognad till risk – Kontroversen om ADHD i två medicinska tidskrifter. *Socialmedicinsk Tidskrift* 94(1): 81–89.

### PEER-REVIEWED CONFERENCE PAPERS

Thodelius, C. & Lundälv, J. (2018). (In)equality before the Law: House Adapting Policy in Sweden. The International Conference AMPS – Architecture, Media, Politics, Society. Health: The Design, Planning and Politics of How and Where We Live. University of the West of England, Bristol, United Kingdom. 25–26 January 2018.

### POSTER PRESENTATIONS AND ORAL PRESENTATIONS AT CONFERENCES

Thodelius, C. (2018). A Place to Die: The Importance of Place Analysis in Youth Suicide Preventive Work. The International Conference AMPS – Architecture, Media, Politics, Society. Health: The Design, Planning and Politics of How and Where We Live. University of the West of England, Bristol, United Kingdom, 25–26 January 2018.

Thodelius, C. & Lundälv, J. (2018). (In)equality before the Law: House Adapting Policy in Sweden. The International Conference AMPS – Architecture, Media, Politics, Society. Health: The Design, Planning and Politics of How and Where We Live. University of the West of England, Bristol, United Kingdom, 25–26 January 2018.

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Thodelius, C. & Lundälv, J. (2016). Ethical Rights and Obligations: Is It Unproblematic Using Social Media as Data in Research Studies? Nordic Youth Research Symposium NYRIS 13, YOUTH MOVES – Voices-Spaces-Subjectivities, Trollhättan, Sweden, 15–17 June 2016.

Thodelius, C. & Lundälv, J. (2016). Exploring and Understanding Environmental Risks and Risk Management. The 24th International Association People-Environment Studies (IAPS) Conference, Lund/Älmarp, Sweden, 26 June – 1 July 2016.

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Thodelius, C. & Sandén H.-O. (2016). Lethal School Violence: Linking Conflict, Relation and Intended Victims. The 2nd Nordic Meeting of the Society for Risk Analysis Europe, Gothenburg, Sweden, 14–15 November 2016.

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## LIST OF ABBREVIATIONS AND ACRONYMS

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**ADHD** Attention deficit hyperactivity disorder, a neuropsychiatric or neurodevelopmental disorder characterized by problems in paying attention and controlling behaviour and by hyperactivity.

**AS** Analytical sociology, a strategy to understand the social world by focussing on mechanisms as well as actions and interactions of individuals, relating them to other macro-level facts. AS can be seen as representing a contemporary incarnation Merton's middle-range theory (MRT).

**ASD** Autism spectra disorder, a neurodevelopmental disorder characterized by difficulties in social communication and/or interaction and by restricted or repetitive patterns of interests, activities, or behaviour.

**BRÅ** The Swedish National Council for Crime Prevention (Brottsförebyggande rådet), a Swedish government agency under the country's Ministry of Justice acting as a centre for research and development within the judicial system.

**CPTED** Crime Prevention through Environmental Design, a multi-disciplinary approach to deterring criminal or deviant acts through environmental design.

**DOR** The Cause of Death Database (Dödsorsaksregistret) of the Swedish National Board of Health and Welfare covers all those registered as inhabitants of Sweden at the time of their death, regardless of whether the death occurred inside or outside the country.

**ICD** International Classification of Diseases is the standard diagnostic tool for epidemiology, health management, and clinical purposes, developed and maintained by the World Health Organisation.

**ID** Intellectual disabilities include general learning disabilities and mental retardation (MR). IDs are a generalized neurodevelopment disability characterized by significantly impaired intellectual functioning.

**IDB** Injury Data Base, an injury registry used locally at emergency rooms in approximately seven per cent of all Swedish hospitals. It is administrated by the country's National Board of Health and Welfare.

**IPTED** Injury Prevention through Environmental Design, an approach to reduce the amount of injuries or the consequences of injuries through environmental design.

**IR** Interaction rituals, a theoretical construct developed by Collins (2004) to help describe how social life is driven by situated interaction rituals and the way these rituals generate collective symbols and collective membership.

**MM** Mixed Method implies mixing qualitative and quantitative data, methods, methodologies, and/or paradigms in research, in a study, or in a set of mutually related studies with the intent of providing findings that are more comprehensive and complex.

**MRT** or Middle Range Theory, as coined by Robert K. Merton, is an approach in sociological theorizing that aims to integrate theory and empirical research.

**MSB** (Myndigheten för samhällsskydd och beredskap) is the Swedish Civil Contingencies Agency, with responsibility for civil protection, public safety, emergency management, and civil defence in Sweden.

**ODD**, or Oppositional Defiant Disorder, is a neurodevelopmental disorder characterized by irritable mood, defiant behaviour, or vindictiveness. In contrast to Conduct Disorder (CD), however, individuals with ODD do not usually behave aggressively towards other people or animals and show no signs of deviance.

**PAR** (Patientregister slutenvård) is a Swedish in-patient registry, based on individual hospitalization statistics. It is administrated by the National Board of Health and Welfare.

**RAT**, or Routine Activity Theory, is an opportunity theory aiming to explain the convergence of likely offenders, suitable targets, and the absence of capable guardians against violation. RAT looks at crime as an ecological process, relating to the environmental elements of crime place. It was originally developed by Cohen and Felson (1979) but has been further elaborated in subsequent years.

**SAMS** stands for Small Areas for Market Statistics, a geographic classification system. The country of Sweden is divided into approximately 9,200 SAMS areas.

**SAT** or Situational Activity Theory was developed by Wikström (2006, 2011, 2014) as an explorative unified theory of crime causation. According to SAT, certain specific key casual processes move individuals to engage in crime, as significant personal and environmental factors the mutual interaction of which initiates and influences the process.

**SCB** (Statistiska Centralbyrån) is the official abbreviation for Statistics Sweden, a government agency responsible for developing, producing, and disseminating official statistics in Sweden.

**SCP** refers to Situational Crime Prevention, a paradigm in criminology first recognized by Sutherland in 1947 but not developed until the 1980s by Ronald V. Clarke. The core premise of the paradigm is that crime needs to be understood and prevented in its immediate physical and social settings, instead of merely analysing and working with the perpetrator.

**SES** Socio-economic status is a measure of an individual's or a family's position in relation to others, based on income, education, and occupation.

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\* The images have been manipulated slightly to preserve the anonymity of the persons and places involved.

# PART ONE: GENERAL INTRODUCTION

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Figure 1. Transformation of the residential area at night, and the emergence of new risky situations. Photo: Charlotta Thodelius.



## 1. DISSERTATION ROADMAP: BACKGROUND AND RATIONALES

---

The studies making up this dissertation examine adolescent injury events as situations, such as residential situations, schooling situations, and suicidal situations, by elucidating the mutual influence between situated activity and the physical environment in injury events. Since an event always takes place in relation to, and entwined with, a certain space, with doing understood as being about processual performativity of space (Högström, 2017:144ff.), the spatial and material are interrelated with social and behavioural patterns (e.g., socio-spatial practices). This relationship is important to recognize in prevention work in order to avoid failures (see Ekblom, 2011b:12ff.). As Heidegger stresses in a classical remark of his, ‘You cannot divorce man and space’ (Heidegger, 1954, cited in Norberg-Schulz, 1971:16). Successful prevention work, however, also depends on interdisciplinary and transdisciplinary approaches, such as those used in this dissertation (cf. Gibbons et al., 1994; Lawrence, 2004). It needs to be both theoretically and practically oriented, and not only rely on, for instance, biomedical symptom-treatment interpretations of the relationship between health and built environment (cf. Lawrence, 2004). Before outlining the structure of this dissertation, I want to briefly address the question of the justification of its topic and methods: Why focus on adolescents’ injury prevention in a Ph.D. project in the field of architecture?

Firstly, there is a knowledge gap in previous research. The majority of the research on adolescents’ injury events thus far has focused on traffic-related injuries, self-harm events, or injuries due to violence in public places; only few studies have focused on the settings of adolescents’ everyday life (see, e.g., Thodelius, 2016:14ff., 40 ff.). Furthermore, research has not covered the full range of places where injuries occur. At least in Sweden, the overlooked residential settings are the most common among these (National Board of Health and Welfare, 2015). For these reasons, this dissertation focuses mainly on the kind of settings in which adolescents’ everyday lives take place, looking at injury events in residential settings, interpersonal injuries in school settings, and suicidal events in semi-private and public settings. The hitherto implemented preventive countermeasures have, moreover, in general not recognized the relationship between situated activity and the built environment. Overall, they have mostly been socially oriented, using legislation, policies, and information campaigns to target known individual risk factors, instead of risky situations emerging from the interaction between the individual and the environment (see, e.g., Gustafsson, 2010; Ministry of Health and Social Affairs, 1979, 2003; National Board of Housing, Building and Planning, 2011). In this dissertation, the situational perspective is maintained and highlighted primarily by adapting the concept of Crime Prevention through Environmental Design (CPTED) for the purposes of Injury Prevention through Environmental Design (IPTED). Originally, CPTED referred to a set of place-based prevention strategies aiming to reduce crime events and increase safety (Cozens, Hillier & Prescott, 2001), and it is also one of the few prominent prevention strategies to directly involve architectural or design practice (see Ekblom, 2011a; Weisburd et al., 2017).<sup>1</sup>

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<sup>1</sup> ‘Design’ here is defined as spatial configurations and as a mediator between preconditions (or space), intentions (defined as programmes), experience, use, and devised space (or guidelines) (cf. Högström, 2017:144).

Secondly, most previous research on injury events and prevention has been carried out as monodisciplinary investigations, which can then easily undermine its original good intentions. Injury research, injury prevention, and implementation are also research fields marked by great complexity, mainly since multiple risk factors tend to correlate at micro, meso, and macro levels in an injury event. This dissertation therefore employs a transdisciplinary approach, enlisting sociological and criminological theories about built environment and architectural performance and analysing these with the aid of research methods from the field of public health and crime prevention. In contrast to most previous studies, this dissertation both explores observable injury patterns and interprets emerging patterns in terms of the socio-spatial practices and situational elements of importance involved. To be able to systematically map and analyse such situational elements in injury events, a mixed method approach is, to various degrees, applied in the individual studies included in this dissertation (cf. Creswell, 2014:228; Reichertz, 2010). The approach should result in more comprehensive research, in combining the ‘general picture’ (e.g., through the mapping of injury patterns) with an understanding of the emerging patterns (e.g., socio-spatial practices and situational elements) in a manner befitting this dissertation’s aims.

Thirdly, this interdisciplinary and transdisciplinary approach also relates to one of the underlying topics of any research today: the development of social sustainability. For me, social sustainability engages several aspects of social justice and quality of life, all which are intertwined and influence one another. One productive way to work with complexity-related topics and those involving clear social aspects is by collaborating with societal actors. While sustainability, in general, is too complex a notion to be easily or simply defined, the notion of it used in this dissertation relies on Shepherd and Patzel’s (2011) distinction between ‘what should be preserved’ and ‘what should be developed’. Injury prevention can then be understood as an area that can be tackled from the social sustainability perspective, since it includes both the perspective of preserving health and the objective of developing safer environments. The findings from this dissertation research can, accordingly, be used as a starting point in the project to develop situational prevention strategies related to the built environment. It is also important to stress that the countermeasures suggested in the dissertation be seen as a complement to social countermeasures, not their replacement, even if these measures do need to be understood in a socio-spatial context comprehending the built environment, the natural physical environment, and the social context.

### 1.1 Dissertation Structure

This dissertation is a so-called compilation (article) thesis, consisting of a set of papers. It is based on three separate research projects resulting in a total of six articles already published, accepted for publication, or submitted for publication in an academic journal or a book anthology. The articles, all included in this dissertation, elaborate on different aspects of the relationship between built environment, adolescents, and injury events (see Appendices I–VI). In this introductory chapter, I attempt to position and contextualize, on the one hand, the research behind the individual articles and, on the other hand, the need for further theoretical development and rethinking around the topic of injury events, in order to enable the development of preventive measurements.

This dissertation is structured around three parts. Part One: General Introduction contains a description of the dissertation requirements and research aims, while at the same time contextualizing the research and situating it in a theoretical and methodological framework. Part Two: Results starts out with a review of previous research in the field of injury events and injury prevention, followed by, first, a presentation of the findings from the separate studies making up the overall research for this dissertation. Part Three: Discussion sums up the main results in a concluding section, in which I also develop concrete suggestions for preventive measures and discussing these in relation to the research aims, previous research, and relevant theory. The question of the limitations of this research and the validation of its results is also addressed, with suggestions for further research.

## 1.2 Definitions Used

The terms ‘adolescents’, ‘injury’, ‘injury event’, and ‘injury location’ occupy a central position in this dissertation. In this sub-section, the way these terms are defined and used in it is described and briefly discussed.

### *Adolescents*

As Valentine and others (1998) have noted, adolescents are, quite problematically, often defined as a homogeneous group. In our contemporary Western societies, adolescence is usually used to refer to the age of the physical body, bestowing meaning on identity and action (Valentine et al., 1998:2). Such a definition of the term is, however, of quite recent origins, having come about with the increasing acknowledgement of adolescence as a concept similar to childhood. Adolescence is, accordingly, an invented life phase, meant ‘to create a breathing space between the golden age of “innocent” childhood and the realities of adulthood’ (Valentine et al., 1998:4). To be young and included in the category of people characterized as adolescents is, nevertheless, not an attribution that can be based strictly on one’s physical age or be permanently anchored to it; it is also something that, as a category and a concept, transforms over time, the same way all concepts change with societal changes. In this dissertation, ‘adolescence’ is therefore not defined as an age group, but rather as something that Eriksson (1963:25) has defined as the phase of identity-versus-role-confusion, staged between latency and maturity.

### *Injury and Injury Event*

The definition of ‘injury’ in this work is based on Langley and Brenner’s (2004) definition of it: an injury is different from other related concepts due to the fact that injuries occur in conjunction with a (sudden) trigger incident/event with a direct connection to the pathological condition. In addition, however, I also distinguish between unintentional and intentional injuries, although not only in terms of intention, but also in relation to the distinction between behaviour and action. Unintentional injuries include events in which the degree of prediction of injury is low and related to behaviour (e.g., mechanical bodily movement with no intention behind it and no meaning for the individual; cf. Weber, 1983). Intentional injuries, in contrast, are a result of deliberate events, characterized by a high degree of awareness of the likelihood of injury from the event, and they are thus related to the concept of action (e.g., meaningful social activity involving both awareness, motives, and feelings; cf. Weber, 1983).

In this dissertation they are, furthermore, defined as either intrapersonal or interpersonal. The former are caused by individual intent on bringing self-harm, while the latter are deliberately caused by another individual (cf. Rosenberg et al., 2006; van Soest & Bryant, 1995).

Also the distinction between ‘accident’ and ‘injury event’ needs to be briefly addressed, given that the two concepts are sometimes used synonymously. It is, namely, problematic to apply the concept of accident to prevention, mainly because, in social discourse, the term is often conceived as something fatalistic and/or unpredictable (Baker et al., 1984; Girasek, 1999; Green, 1997; Torell & Bremberg, 1995). To be sure, also this term is liable to transform over time, as far as the categorization of events included in it is concerned, resulting in an extensive categorization of events of different severity. For example, both falling (an injury event) and the milk’s getting spoiled (unfortunate circumstance) are categorized as an accident in the general social discourse (cf. Green, 1997).

In contrast to accident, the concept of injury event can thus provide an explanatory model for the phenomenon, based on the premise that there is an interrelationship tying together individuals, the environment, and injury agents. This interrelationship covers three distinct phases unfolding in time: the pre-event, event, and post-event phase (cf. Garzon, 2005; Haddon, 1980). During these phases, several discernible factors or elements interact with the individual, the physical, and the socio-cultural environment (Haddon, 1980). In this dissertation, the concept of injury event is, accordingly, used to both facilitate analysis and help highlight the preventable aspects in the events.

### *Injury Location*

In this dissertation, ‘injury location’ is always something defined in relation to a place. Here I distinguish between the setting, the location, and the micro-place, based on the degree of specificity. The setting I define as the general place where the event occurs, such as a school or an apartment block. The location is more specific, being here defined as a particular place within the general setting, such as the classroom, the kitchen, or the bathroom. The micro-place is the most specific entity of the three, defined as a specific place within a specific setting and specific location, such as ‘the kitchen in apartment X at Y Street’ or ‘the railroad platform at Station Z’. The residential area (the home/living environment) represents a continuum of different locations, ranging from the most private setting (defined as the home) to semi-private and semi-public settings (such as shared spaces and common areas in apartment buildings, schools, and malls) and, further, to public settings such as footpaths, streets, and common areas and spaces in neighbourhoods.

Figure 2 below shows how the continuum of the home/living environment is related to the kind of injury events discussed in this dissertation. The residential area is defined as comprehending both indoor and outdoor injuries to have occurred in the immediate environment, defined as a setting and/or a location. Schools, according to the Swedish law, are private settings, although they often function as a hybrid of semi-private and semi-public spheres, given that they often also include some public areas such as libraries or sport centres. The suicidal events studied in this dissertation all occurred in public places, which are therefore here defined as micro-places.

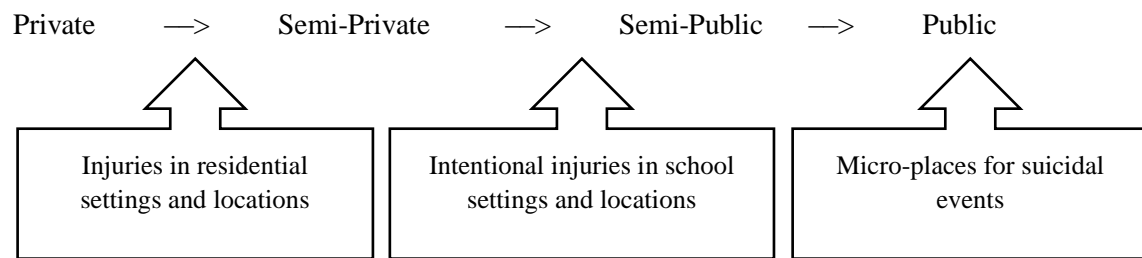


Figure 2. The relationship between the injury events studied and the continuum of home/living environment.

As Mallet (2004) has emphasized, the term ‘home’ is used in research in a way that yields both clear-cut and more obscure or paradoxical definitions. According to Mallet herself, ‘home’ is a concept that is both malleable by nature and interactionist in its character: its meaning changes over time in relation to social norms and structural changes (see also Kemeny, 1992:155ff, 166ff.). Similarly, Dovey (2008:45ff.) has elaborated on the need to re-theorize the term in architecture, as ‘home’ is not only a place where everyday life takes place, but also as a concept referring to different things in terms of its spatiality, cultural context, and social praxis.

In this dissertation, I, similarly to Saunders and Williams (1988:83, cited in Easthope, 2004), define home as a socio-spatial unit, meaning both a spatial unit (‘home as built environment’) and a social unit (‘household’). Accordingly, I look at it as a building characterized by a particular combination of material and symbolic aspects, one in which its seclusion from public settings through both physical boundaries and culturally defined rules contributes to everyday social practices in the form of relationships and activities (cf. Lawrence, 1987; Mallet, 2004). The home, as a private residence, can therefore be defined as one type of dwelling unit in a living environment, as the latter also includes residential institutions and the immediate surrounding areas (cf. Borell & Johansson, 2005; Lawrence, 1987). However, there are two main differences between private residences and the residential institutions. The first is that there are different cultural and social rules shaping the everyday life in these dwellings, and the second is that the degree of one’s control over the private residence is greater, as concerns things like furnishings or the use of surfaces. Residential institutions can therefore be defined as capsule environments in which individuals are brought together for a specific purpose in a bounded location (Wortley, 2008:61–62).

Among other units representing living environment are schools, built as they often are in the vicinity of the immediate surroundings of private residences (i.e., in ‘neighbourhoods’). At the same time, however, schools are complex settings, integrating different clusters of events related to the injury paradigm, such as minor incidents of violence, physical and psychological abuse, and so on. It is important to note, however, that these events do not occur randomly. As Dovey and Fisher (2014) have shown, the school is a setting where the socio-spatial assemblage for example includes different processes, such as the construction of territories, boundaries, and identities. This perspective is similar to that of McLaren (1999:85ff.), who describes the interactive states of adolescence, or the different styles of interacting with the environment. In schools, for instance, the student style and the street-

corner style intertwine, doing that to differing degrees depending on the activity. The student style can be dominant in schools' own organized activities such as classes held in the classroom. During the recess, on the other hand, the student style often transforms into the street-corner style, entailing other rules for ritual interaction (McLaren, 1999:100).

The most common place for adolescents to commit suicide is the private residence, followed by hospitals and outdoor areas (e.g., Kposowa & MacElvain, 2006; cf. Lester & Stack, 2015:73ff.). Regardless of this fact, however, that suicides most often occur indoors and in a private home, this study examines suicide hotspots in outdoor locations. This I not only owing to the limited real-life possibilities such as of researching suicides in private homes, but also because of the preventive concerns in this dissertation that aim to reduce injuries through the design of the built environment. In this work, 'suicide hotspots' refer to specific micro-places consisting of easily accessible and often public sites frequently used as locations for suicide (cf. Cox et al., 2013).

### 1.3 Basic Assumptions and Research Scope

The research for this dissertation was conducted as part of a broader interdisciplinary research project ArchSafe, funded by the Swedish Civil Contingencies Agency (MSB).<sup>2</sup> The project participants came from three different academic fields and departments in the city of Gothenburg: the Department of Architecture and Civil Engineering at Chalmers University of Technology, the Department of Sociology and Work Sciences at the University of Gothenburg, and the Department of Social Work at the University of Gothenburg. My own academic background is in criminology and sociology, which can raise the question of whether non-architects can research architectural issues. However, design research is interested in the same triad of subjects as social sciences in general: it looks at the interrelationship between humans, objects, and their context (cf. Love, 2002), reducing the distance between the different disciplines.

In this dissertation, I bring together theoretical assumptions and methodological approaches from different disciplines in the interest of studying socio-spatial practices from the perspective of what Weber (1962) termed as *verstehen*, in order to research actors in a way that takes into account the meanings they themselves ascribe to their actions in their environment and in their social context. Before discussing the scope, aims, and guiding questions of this research, however, I want to elaborate a little more on one other important starting point for it – namely, that in order for it to produce useful results, it is necessary for it to combine interdisciplinary and transdisciplinary perspectives (cf., e.g., Klein, 1990).<sup>3</sup> It is, to begin with, generally acknowledged today that transdisciplinary approaches are required to solve the complex research challenges of our time (e.g., Murray, 2013:97).

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<sup>2</sup> See the project presentation at <http://www.chalmers.se/sv/projekt/Sidor/Riskgruppsanalys-och-fallstudier-av-olika-skadeh%C3%A4ndelser-i-hem--och-boendemilj%C3%B6.aspx> (5 October 2017).

<sup>3</sup> Note that, as Klein (1990) has reminded us, interdisciplinarity is different from multidisciplinary (more than one discipline working on the same problem, but without discussion), pluridisciplinarity (disciplines interacting on the basis of work from other disciplines), and transdisciplinarity (organization of interdisciplinary research co-ordination of all areas of knowledge under a single unifying vision).

While interdisciplinary research is typically conducted inside the academia, transdisciplinary research is often conducted outside of it.

Interdisciplinary perspectives in research generally aim to link knowledge, methods, terminology, and expertise from different disciplines, to bridge gaps between these (Barry et al., 2008; Gibbons, 1997; Gibbons et al., 1994; Klein, 1990). This is attempted in the dissertation not only by engaging the discussions around the AIDAH (Gromark et al., 2014) and the ArchSafe projects, but also through close co-operation with three other research centres, Centre for Healthcare Architecture (CVA), Centre for Residential Architecture (CBA), and Urban Safety and Societal Security Research Centre (URBSEC).

In the course of my research, these centres also functioned as a bridge enabling a real employment of a transdisciplinary approach. They offered for it an extended network of societal actors, stakeholders, and practitioners that could be enlisted to the service of the research process (cf. Polk, 2014), bringing with them their own particular perspectives. While the resulting kind of transdisciplinary research is often considered an inclusive type of research, there, however, nonetheless appears to be a lack of clarity regarding what degree of involvement in research is required for one to be able to characterize the research process as actually inclusive. Is, for example, an interview study with various practitioners inclusive *per se*?

On the whole, however, transdisciplinarity in architectural research remains hard to define. As emphasized by Doucet and Janssens (2011:9), a transdisciplinary process nevertheless needs to include certain key elements, such as an understanding of the ethical dimension of spatial practice and the recognition of an aesthetic and creative dimension of the architectural and design process. These elements are connected to three distinct yet related elements in architecture: accountability, representation, and contingency (Doucet & Janssens, 2011:11).

My own position on transdisciplinarity derives from my view of knowledge production: I see research as a form of knowledge production that requires a great degree of involvement from its participants both inside and outside of the academia, especially where the aim is to produce concrete suggestions to help in the development of practical strategies (cf. Björk, 2016:103ff.). In a transdisciplinary approach, the participation of stakeholders appears necessary, since they can contribute with concepts and knowledge from outside the academic context (cf. Lawrence, 2010). Such participants also possess unique knowledge and experience, and therefore need to be given a role in both the problem definition and the internal validation of results (Flyvbjerg, 2001:91, 115ff, 121, 166). My work in this dissertation is also inspired by Abrahamsson (2015), who has stressed the importance of co-creation in the production of knowledge for socially sustainable cities. Here co-creation encompasses the entire decision-making process, from the formulation of the problem to the analysis of opportunity structures, the identification of countermeasures, and the implementation of these measures.

Several actors and stakeholders were thus involved in the research process behind this dissertation. Their participation and involvement in it, however, varied in terms of its degree and scope, as Figure 3 shows.

Low	<b>2014–2018:</b> ArchSafe project group: co-research, co-authorship, peer reviews, feedback loops ArchSafe reference group: served as reviewers for the project group’s comprehensive research		
	<b>2016:</b> Workshop 1 (together with Björn Andersson/ArchSafe): ‘Mapping Intentional Injuries in the Home, Neighbourhood, and Institutional Settings’  <i>Participants:</i> One employee from Police Region West and one employee from one of the child and youth psychiatric wards in the City of Gothenburg.	<b>2017:</b> Workshop 2 (together with Björn Andersson/ArchSafe): ‘Mapping Injury Localization and Risk Environments’  <i>Participants:</i> Representatives from Police Region West, Greater Gothenburg Emergency Services, City of Gothenburg Social Resource Management, local government, School Development Centres of the City of Gothenburg and the municipality of Kungsbacka.	<b>2017:</b> Interviews and member validation of the analysis of suicides  Conducted with employees from Police Region West and Greater Gothenburg Emergency Services.
High	<b>2015–2017:</b> Research Circles 1 & 2 (together with Jörgen Lundälv): ‘Perceived Injury Risks and Risk Management’. <i>Participants:</i> Representatives of disability organizations, patient associations, and advocacy organizations.  <b>2017–2018:</b> Research Circle 3 (together with Björn Andersson): ‘Safe and Secure Schools’. <i>Participants:</i> Representatives from Police Region West, Greater Gothenburg Emergency Services, City of Gothenburg Social Resource Management, local government, and the School Development Centres of the City of Gothenburg and the municipality of Kungsbacka.		

Figure 3. Research participants and their degree of involvement in the project.

### *Some Notes on the Setting of the Research Scope and Boundaries*

The general research questions addressed by ArchSafe are these two: Which groups are at the highest risk of being injured in the residential area? In what way can the physical design of the residential area hinder or reduce the consequences of injury events? Compared to most traditional research in the field of residential studies covering the home setting or the dwelling, this dissertation has a broader scope that helps to expand the definition of this subject area. The 'residential area' in this dissertation contains a broad spectrum of (possible) injury locations in the continuum of the private, semi-private, semi-public, and public places in the neighbourhood. In addition, adolescents as a risk group for injury events in residential areas have seldom been focused in research, making it essential to explore this group's risk exposure and vulnerability further, as attempted in this work.

The process to setting the scope and boundaries for this dissertation research took place following the submission of my licentiate thesis. In that thesis, the scope of my research was still quite broad. I studied people aged from 0 to 19, with my main focus on exploring risk as much as an empirical as a theoretical concept. The main conclusion of the thesis was



that injury patterns were caused by a combination of individual traits and preconditions, everyday life organization, spatial dimensions defined on the basis of socio-spatial practice, and time exposure, resulting in different risk environments, risk exposures, and risk perceptions (Thodelius, 2016). To narrow down this rather broad scope making the project quite cumbersome, and to focus more specifically on the built environment, I, in preparation for my doctoral dissertation work, first conducted an extensive literature review, which revealed a knowledge gap on injury research related to adolescents' everyday life. In addition, I discussed with primary and secondary stakeholders to collect their views, experiences, and impressions about adolescents' injury risks and injury events. In the course of this process, when comparing the accrued academic and tacit knowledge, it became possible to limit the research scope by defining it based on the *extent of injuries* and the (potential) *injury locations* of adolescents.

The measure of the extent of injuries, on a general national level, was determined using previous published statistical reports as an aid, mainly those by the National Board of Health and Welfare of Sweden. These reports often lump together the epidemiological findings for the age group 0–17 years, with no distinction between the different age categories within the group and no information on the injury locations.<sup>4</sup> In 2015, a total of 16,163 children and adolescents aged 1 to 17 years were treated for injuries as inpatients in Sweden. Nonetheless, not even close to all injury events lead to hospitalization: approximately 140,000 individuals in the age group 0–17 years in the country visited an emergency room seeking care for an injury event in 2015 (The National Board of Health and Welfare, 2017).

Injury events are also a significant cause of death in this same age group. In 2015, a total of 74 individuals deceased due to an injury event (65% men and 35% women). Unintentional injuries were the reason for 50 per cent of the deaths, being mainly transportation or traffic-related events. In addition, suicide was the cause of 32 per cent of the deaths (The National Board of Health and Welfare, 2017). Fatal injury events are more common among adolescents, especially boys, with two thirds of those involved in them in 2013 dying at the age of 12 or older and 41 per cent at the age of 15 or older. The overrepresentation, however, is there only in unintentional fatal injuries, not in intentional ones (The National Board of Health and Welfare, 2011, 2017).

If unintentional injuries then appear to be the main cause of both hospitalization and fatalities, they have also been found to have to do with age-specific risk exposures as well as development and maturation-related processes of individuals (e.g., MSB, 2011). This points to the importance of examining location in terms of the concept of structured time and routine activities (cf. Cohen & Felson, 1979; Hindelang et al., 1978; Mancini & Huebner, 2004). To gain knowledge of, and define, 'typical adolescent (risk) settings', a workshop was conducted with a focus on stakeholders' experiences regarding injury occurrences as well as their opinion about injury locations important for prevention. In the

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<sup>4</sup> Some of the reports, to be sure, are based on IDB (the European Injury Data Base), which identifies many injury locations. However, since IDB is not a national register, the reports based on it have a low degree of generalizability. The advantages and disadvantages of using IDB will be discussed later in this dissertation, since the database was also one of the statistical data sets used in this research.

analysis, three key settings emerged: the home, the neighbourhood, and the school (conceptualized everyday spaces for adolescents; cf. Valentine et al., 1998:10; Viner et al., 2012). Of these, the home and the school are places for organized activities, and are therefore more ‘compact’ as spatially limited areas, for which reason these two settings seemed suitable for an in-depth study of adolescents’ injuries and injury prevention. In contrast to the two, the neighbourhood has the character of a place for unorganized activities related to peer relationships, and it is also less compact or neat as a category, since the boundary between space and place is quite blurred, giving rise to liminal space. The latter, according to Turner (1982:56), is about experienced flow in the moment, with actions under control and the distinction between the self and the environment blurred.

Once the injury extent and the emerged risk settings were determined, the two elements still needed to be linked in order to be able to define a valid research scope. This was done by combining previous research and the study’s theoretical constructs with the stakeholders’ narratives. In the workshops, different injury events were mapped into different settings and later prioritized. The results brought to light two notable aspects of importance for the field of injury research. The first of these was the *place as a unit of research* (e.g., injuries in the home environment and intentional injuries in schools), while the second was a *specific injury type as a unit* (e.g., suicidal events). These units are also relevant for research in a certain societal context, here taken to be the risk society of Bauman (2006) and Beck (2002). A risk society is mainly characterized by its emphasis on risk management and security as social goals (Beck, 1992), while the risks are at the same time also connected to social amplifications (Green, 1997:140; Kasperson et al., 1988) and to what Bauman (2006) has defined as liquid fear. In such a context, any research done needs to avoid stigmatization and the creation of moral panic related to adolescents’ socio-spatial practices, which can only result in repressive or imprecise and therefore ineffective preventive countermeasures (cf. Cohen, 1987; Goode & Ben-Yehuda, 1987).

#### 1.4 Research Aims

The aim of this dissertation is to explore and explain adolescents’ injury events as situated activities related to the built environment. Its results are intended to enable the formation of effective prevention strategies based on modification of the built environment. The research was structured around three separate studies on different injury or risk situations in adolescents’ everyday life.

The *first study* focused on injuries in residential situations. To investigate these, the study brought together different perspectives gleaned from previous research and deemed as particularly relevant for the topic. These centred on gender and age (cf. Ferrante et al., 2014; He et al., 2014), socio-economic position (Hjern et al., 2001; Osbone et al., 2016; Reimers & Laflamme, 2005; Russell et al., 2015), disability, impairment, and/or chronic illness (cf. Chou et al., 2014; Petridou et al., 2003; Rowe et al., 2004; Yung et al., 2014), and certain aspects related to the built environment itself (Sengoelge et al., 2013). The role of these aspects in injury events is looked at more closely in Papers I, II, and III.

The *second study* focused on interpersonal injuries in school situations, elaborating on the connection between specific location and injury risk in terms of ‘owned’ and ‘unowned’

places in schools. Its findings highlight the need to understand school settings as clustered assemblages influencing, and in turn being influenced by, socio-spatial practices (cf. Astor et al., 1999; Dovey & Fisher, 2014; MacLaren, 1999; Mulvey & Cauffman, 2001). The empirical part of the study looked at violent everyday situations ranging from more minor incidents to rare phenomena such as lethal violence (Papers IV and V).

In the *third study*, suicidal situations were analysed in terms of different kinds of suicide method, choice of place, and external factors related to the event (cf. Lester, 2009:7ff.; Lester & Stack, 2015). The main aim of the study was to explore the function of place-making in suicidal events. This was done by defining suicidal acts as meaningful social action (cf. Douglas, 1967), in the interest of enabling the formulation of place-based prevention strategies. The results of this study are presented and discussed in Paper VI.

All these three studies shared a common feature in exploring and elucidating some of the situational elements, situational mechanisms, and socio-spatial connections of significance for injury situations. In doing so, they, moreover, sought to quite concretely assist in the development of situational prevention strategies based on design aspects and aiming to help reduce the risk and number of injuries in adolescents' everyday settings.

The combined research work carried out for this dissertation can therefore be looked at as consisting of two interconnected strands. The first of these involves identifying and analysing injury patterns, while the second relates to the development of possible countermeasures having mainly to do with design elements in the built environment (cf. Ekblom, 2011b). The resulting dual research process can be visualized as a loop in which the objective of the first process is located on a general, abstract level, its aim being to contribute to theoretical and methodological development, mainly in the form of the development of the IPTED concept. The objective with the second process is to develop and discuss comprehensive prevention strategies based on concrete cases and other empirical material from the research work done within the framework of this dissertation project. It can be thus seen as an attempt to translate the theoretical assumptions behind IPTED into praxis.

### 1.5 A Note on Causality

As shown in previous research (see Section 4.1), there are a variety of intrinsic and extrinsic risk factors that influence injury occurrence. These have to do with, in particular, age, gender, possible presence of a disability or chronic ailment, the type of activities performed, the kind of structural factors present, and, last but not least, the environmental exposure, which make any discussion about causality only that much more complicated.

Risks in general can be said to be either probabilistic or socially constructed, and be located on either a societal or an individual level (cf. Green, 1997:140; Hallin, 2013; Renn, 1998). In traditional risk research, one of the most common ways to understand risk is by using various risk assessments models, relying on (mainly) risk estimation equations ( $P \cdot C = RV$ ). The equations are based on two key estimates, that of the possibility of an event (P) and the consequences of it (C), which are then calculated into a risk value (RV). The higher the risk value, the higher the need for implementing countermeasures suitable to the model.

As Douglas and Wildavsky (1982:5ff., 86ff.) have argued, probabilistic risk relies on constructed reality, leaving the underlying causes of individual behaviour unanalysed. However, as Thomas and Thomas (1928:527) have observed, individuals tend to act on socially constructed risks based on perceived reality. Furthermore, risk is not only something affecting us at the individual level; it is a property of the structural level as well. Risk in today's risk society no longer represents a neutral term for the calculation of probabilities; it signifies a specific danger, one that is often socially amplified. This social amplification is manifested in processes in which events with a low degree of probability and non-serious consequences end up causing great concern and producing an extraordinary impact in society (cf. Bauman, 2006; Beck, 1992; Green, 1997:140; Kaspelson et al., 1988). This notion of different risk constructions and the discrepancy between them in risk management and risk prevention are important to consider, since traditional risk research and prevention strategies in general focus on probabilistic or social risks and not on socially constructed risks (cf. Douglas & Wildavsky, 1982:5ff., 86ff.; Renn, 1998).

In order to make successful interventions in injury prevention, one, however, first needs to understand the complex relationships between factors whose interaction produces the injury event. In doing so, one nevertheless needs to be wary of getting trapped in what Matza (1964:23ff.) has described as a state that only leads to there being too many factors to be considered – the hopeless situation of having to argue that everything matters. Yet, our understanding of risk or risky situations needs to be contextualised at both a societal and an individual level, since risk perception affects both the interaction between humans and their surroundings and the relationship between those surroundings and the social context/structure. At the same time, however, the risk also needs to be situated, narrowing down on factors that matter and separating them out from those that do not (Matza, 1964:23ff.).

In previous research, modification of the environment, mainly as concerns its usability or its interior design, has been an oft-suggested injury prevention strategy (e.g., Ceccato, 2016; Haddon, 1972, 1980; Lester, 2009; Pollack et al., 2014; Torell & Bremberg, 1998; Wegman et al., 2002). At the same time, there has been a call for more research in the field, to assist in the development and formulation of suitable countermeasures. Consequently, there is a need for the environmental perspective to accommodate within itself, and co-ordinate, different efforts and multifaceted approaches and make them work in tandem (Peek-Asa & Zwerling, 2003:87; Towner et al., 2001; Towner & Mytton, 2009). To enable that, one must construct a coherent theory that not only is predictive, but also integrates a multi-causation perspective as a heuristic device, integrating and classifying various strands of theories to facilitate new discoveries and new solutions (cf. Matza, 1964:22).

All in all, then, even if the environmental factors are under-researched in injury studies, it is undeniable that they matter for the emergence of injury situations and the way these situations unfold. To show this, however, we must first develop a coherent theoretical framework, accommodating crucial situated factors that influence the human–environment relationship. Only that way can we develop more suitable and thus more effective prevention strategies where that remains the goal.

## 2. SPATIALITY, SITUATIONS, AND INJURY PREVENTION: A THEORETICAL MODEL

In this chapter, the theoretical framework of this dissertation is presented. It combines the perspectives of architecture and sociology, which also intertwine in, and inform the shaping of, our real-life built environment, our social interaction, our situated activities, and our societal context. Cross-disciplinary in nature (cf. Love, 2002), it has three main features: 1) in relating social-spatial practices to design research, it draws on the disciplines of architecture, criminology, and sociology; 2) it construes injuries as situated activity; and 3) it reinterprets injury prevention based on architectural performance, by adapting the principles of CPTED to IPTED.

### 2.1 Preliminary Remarks on the Vagueness of Architectural Design Theory

As Ekblom (2011a) has pointed out, in research there is a general vagueness to the concept of architectural design that brings negative consequences to research in the field, threatening to make it more relativistic and eclectic. Indeed, architectural design theory in general tends to be synergic, linking research and praxis, with no clear borders drawn between theoretical and tacit knowledge (Murray, 2013:96). This vagueness indicates that there is a need for a stronger, more clear-cut definition of architectural design and design research, as well as the development of an established design theory (Friedman, 2003; Love, 2002). As Friedman (2003:508) has argued, the theoretical framework of design research ought to be built at the intersection of six general domains of scholarship: natural sciences, humanities and liberal arts, social and behavioural sciences, human professions and services, creative and applied arts, as well as technology and engineering. This will then split the research focus along two dimensions – the field of pure research and the field of applied research. In a sense, however, Friedman's (2003) proposal here can be seen as contradicting Schön's (1983) stance on theory construction. According to the latter, what defines the researcher in practice is the quality of 'reflecting-in-action' in unique cases (Schön, 1983:86). It is possible, however, that Friedman and Schön talk about research in different research contexts (e.g., about different research scopes or the distinction between basic and applied research), mainly because, as Friedman emphasizes, the concepts of theory and theory construction need to be more explicitly discussed in architectural design research, making any distinctions such as these valuable and of importance (Friedman, 2003:511).

Furthermore, also the task of developing a coherent cross-disciplinary body of theory is intertwined with certain philosophical questions involving metaphoric, ontological, and epistemological issues as well as certain core concepts (Love, 2002:351), all of which need to be addressed. Architectural design research can be conceptualized as being based on three key elements: *humans*, *objects*, and *contexts*, assembling within it nine different areas of research and theory construction (see Love, 2002:349, summarized in Table 1). These nine areas, in turn, correspond to other disciplines addressing the same area of research. To take an example: to understand a person's behaviour, one needs the perspective of disciplines such as biology, psychology, anthropology, and history, while human and object interactions rely more on factors analysable from the standpoint of aesthetics, ergonomics, philosophy, and sociology (e.g., Love, 2002:350).

Table 1. Areas of research and theory construction in architecture (modified from Love, 2002).

Research elements	Human	Object	Context
<b>Human</b>	Human	Human–Object	Human–Context
<b>Object</b>	Object–Human	Object	Object–Context
<b>Context</b>	Context–Human	Context–Object	Context

The research for this dissertation can be defined as applied research into design, with a focus on the work of architecture in influencing the human–object, the human–context, and the object–context relationship and interaction within a spatial organization (cf. Love, 2002:350). In the next section, I will address the relationship between space and place in injury research, situated activity, and the adaption of injury prevention, since, as Jacobs and Merriam (2011:212) have emphasized, architecture includes both material matter and human ‘mattering’ (meanings and judgements).

## 2.2 (Re)Discovering Space and Place in Injury Situations

The architectural process is about ‘transforming’ space to place (Durmus, 2012), integrating symbols (e.g., creating meaning), structures (e.g., physical boundaries), and subjects (e.g., subjects’ experience and perception). The integration of symbols, structures, and subjects is visible in all key aspects of architecture, such as in the ‘performed’ building or the conceptualized design. Even if the transformation aspect is rather abstract and thus not always easily grasped, it needs to be addressed since understanding the built environment requires understanding the space/place concept. In his work, Lefebvre (1991) has constantly, from 1974 on, addressed himself to the problem of the production of space, elucidating, in his spatial triad, the dynamic interrelation between three elements of the produced social space: perceived, conceived, and lived space. Even though he (Lefebvre, 1991:7) draws a distinction between different aspects of space, he stresses the way these are all intertwined and affect one another (see Figure 4).

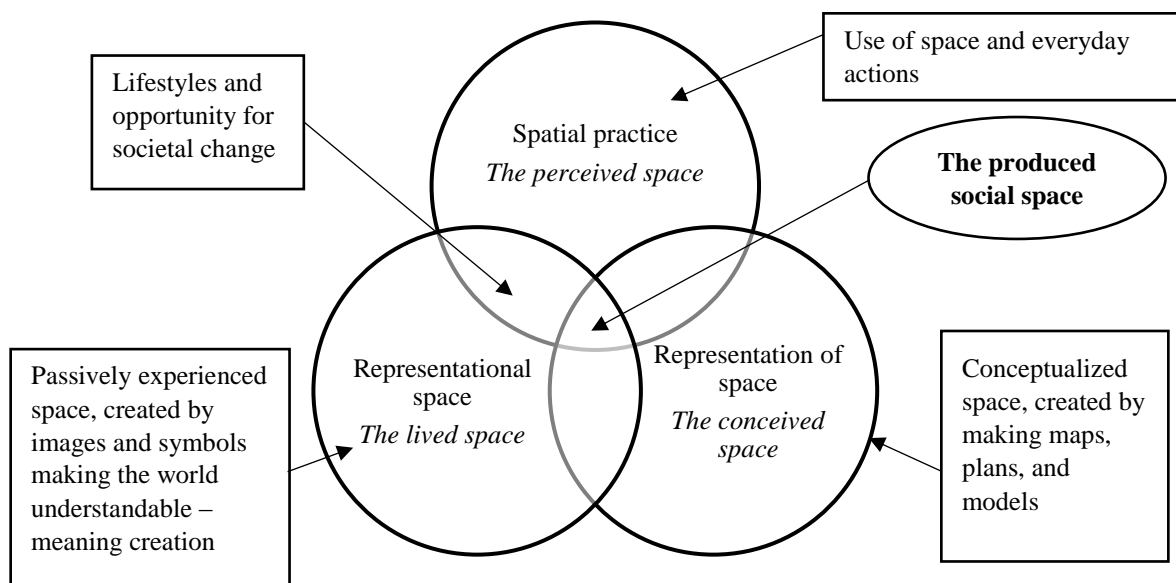


Figure 4. Lefebvre's spatial triad.

According to Lefebvre (1991:42), the lived space (*l'espace vécu*) is unconscious, since it is passively experienced in everyday life. Nevertheless, it manifestly (re-)produces images and symbols, through the physical structure and layout. The representation of space, or the lived space, structures the lived practice, mainly since lived space expresses visions of society, by fusing the material and the cultural, or through the social creation of space. Thus, in the social creation of space, symbols, signs and images become materialized (cf. Cuff & Wriedt, 2010:215 ff.; Dale & Burrell, 2008:10). The fusion or socialization of space in the lived space is possible thanks to the conjoining of the elements of conceived space (*l'espace conçu*), such as through time-typical artefacts or urban planning. This conjoining, in turn, is made possible by the fact that the conceived space, unlike the lived space, is the outcome of conscious action, achieved by mirroring visions, theories, and ideals that influence the planning and execution of space (as when embodying certain conceptualizations in society as dominated space or mode of production; see Dale & Burrell, 2008:9). The third space here is what Lefebvre (1991:38) refers to as the spatial practice, or, perceived space (*l'espace perçu*). This space is associated with lifestyles and societal changes, since it is the place for the negotiation between everyday reality and urban reality. In it takes place the production and reproduction of particular locations and characteristic spatial sets of social formation, creating known space related to daily routines (Lefebvre, 1991:33, 38).

Furthermore, it is of importance to define place even if no coherent picture or consensus regarding the concept can be seen as emerging from previous research. In this dissertation, place as a result of place-making is interconnected with the creation of meaning and closely related to human agency (Agnew, 2011; Simmel, 1997; Tuan, 1977). This configuration between the spatial setting and everyday action is described by Lindahl and Granath (2003) as consisting of two parallel, bi-directional processes: *space prescribes activity*, and *action gives meaning or creates place*. Additionally, place is a three-dimensional configuration. In its first dimension, place is a *locality*, while in its second dimension it is *locales*, and in the third one an abstract feeling, a *sense of a place* (Agnew, 2011). Of these, it is mostly the second dimension that is of interest to injury prevention practitioners, since it is the setting that frames everyday life, by including dwellings and other spatial structures that embody everyday activities. Locales are, in general, fragmented or visualized places, bounded not only by boundaries or territories, but also spatially formed by the built environment (Dale & Burrell, 2008:108ff.; Scott & Lyman, 1968. Space as a visualized place is related to identity, control, territoriality and ownership, creating boundaries in terms of inside/outside (Lyman & Scott, 1969; Sebba & Churchman, 1983), which in turn contributes to a certain attitude towards the area, creating a specific identity for the place or the places and saturating this/these with meaning. As Cuff and Wriedt (2010:215ff.) have pointed out, architectural artefacts are therefore not only a reflection of contemporary power relations (expressed as norms and values or through the expectations of clients); they are also a symbolic medium through which a particular society constitutes itself (Delitz, 2017).

The built environment, moreover, also has a specific purpose: to house and facilitate activities (cf. Lindahl et al., 2011). In residential buildings, furthermore, the traditional dualities of architecture – expression/content, exterior/interior, and form/function – are

given a concrete, visual form (Malmqvist, 1992:15), creating different socio-spatial constructs with different types of built environment characterized by different functions, different intended uses, and different space/place constructions (cf. Koskela, 1996:72). In addition, artefacts impose relationships (Delitz, 2017) in which social interactions emerge between human and non-human actors (such as objects). This interaction, argues Latour (1996), is actively framed and situated. The object should not be neglected in it, but rather understood as an *actant*. Thus, these kinds of interactions also represent an act of exchange of properties between human and non-human actors, or, interobjectivity. Interobjectivity is not only something that has spontaneously emerged or is socially bounded; it also depends on artefacts' usability and intended functions (Latour, 1996).

Furthermore, the interaction between the human, physical, and social environment is in general preconditioned by both the individual and the process of emergence (cf. Kvarnlöf, 2015; Mead, 1932). This emergence,<sup>5</sup> a process affecting individuals' practice, is not always what the architect intended, for which reason practice is always both situated and structurally defined at once. The lived and perceived space creates a setting for everyday life performance, a space where implicitly or explicitly desired behaviour, in terms of performance in relation to the anterior and posterior regions, is influenced by different decorums of either physical or social nature (cf. Goffman, 2006:99ff., 114). Our interpretation of these decorums, however, also relies on the individual habitus. While according to Lefebvre (1991:259), the habitus is one's 'mode of being', here in this dissertation it is the definition given to the term by Bourdieu that is adopted, in order to stress the fact that the habitus is something more complex (Bourdieu, 1977, 1986). In Bourdieu's usage, habitus refers to a motivational mechanism that mediates the overall influence of the objective context and the immediate situation, based on individual biographical factors having to do with class, gender, language, ethnicity, and previous social experiences (Bourdieu, 1977:85ff., 1986:8–9.).

Accordingly, social practices are based primarily on both unreflective and conscious elements in the habituses of individuals, which meditate and are meditated by the surrounding environments. Socio-spatial practice can thus be defined as both behaviour and action (cf. Weber, 1983) and thereby also related to the intended appropriation of place and the unintended opportunities for events as created by place (cf. Cohen & Felson, 1979; Goffman, 1963; Lefebvre, 1991:164ff.; Merton, 1959; Werner et al., 1985). The appropriation process here is interrelated to the transformation of conceived space to lived space, intertwining the lived space with the perceived space, and in that process space is used by individuals as their own, as something to be adapted through the exercise of territorial control, a process supported by architectural practice, with architecture either facilitating or hindering activities (cf. Lefebvre, 1991:164ff; Werner et al., 1985).

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<sup>5</sup> Although Mead's concern was with the emergence between actors and their social environment, in this dissertation 'emergence' is applied in a wider context including also the physical environment, with focus on situated activity in social life.



Architecture is therefore not only about design or physical structures; it is also about influencing the situating of individual behaviour, either intentionally or unintentionally from an architectural point of view (cf. Turner, 1987:12). Thus, events do not just ‘happen’; they are situated in time and location (cf. Dale & Burrell, 2008; Gromark, 2006:31). As Goffman has observed, people’s degree of participation, referring to individuals’ degree of involvement in the situation (their ‘allocation’), defines the characteristics of the situation and creates community. These communities can in the situations be understood as involving a ‘modus vivendi’ that allows each participant to contribute to the common definition of the situation (Goffman, 2006:21). Situations are therefore in their institutional context a specific and distinct part of social life, one that differs from other parts of individuals’ social lives (Goffman, 1963). Along the same lines, Collins (2004) has incorporated the concepts of ritual and interaction into a systematic theoretical framework in which ritual denotes not just the Durkheimian concept of rituals, but also Mead’s and Goffman’s sociological concept of something micro-situated (see Collins, 2004:7ff.). As Collins himself (2004:3) puts it, ‘a theory of interaction ritual (IR) and interaction ritual chains is above all a theory of situations. It is a theory of momentary encounters among human bodies charged up with emotions and consciousness because they have gone through chains of previous encounters’.

Additionally, social practice, or, more accurately, the discrepancy between different social practices, represents a collective act manifesting the social order through shared, internalized norms. ‘Making’ and ‘saying’ are organized around a set of understandings, agreements, rules, and teleoaffective structures (Schatzki, 2005), with the understanding, agreements, and rules based on individual knowledge about how things are expected to be performed while the teleoaffective structures regulate how individuals are to link goals, means, and expressions to a particular common normative notion, which keeps changing over time (Schatzki, 2005).

Conversely, the focus on interactional situational aspects above needs to be linked to both individually situated action and the injury context. As described in Situational Action Theory (SAT),<sup>6</sup> two forms of emergence, social and individual, derive from social interaction and influence action (Wikström, 2011). Owing to this, SAT, as a mechanistic explanation of action, acknowledges the perception–choice process in situations, addressing also the person–environment action (Wikström, 2011, 2014). Accordingly, situational action is always dependent on social interaction, even if the latter is not present at the moment, as historical and contextual processes of emergence (Wikström, 2014:83f.), and all actions are situationally bounded, neither individual nor collective, even if the action in the situation may be interaction dependent on individual or collective levels. The situational model (Wikström, 2006:76ff.) addresses the key situational factors in crime action, such as motivation, the moral filter, and controls (e.g., initiates action; provides alternatives or accounts; influences perceived alternatives), while also being able to explain the mechanism in injuries (because also injury events are situated) and at the same time

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<sup>6</sup> SAT was originally developed to promote understanding of crime occurrence. It integrates a social and a situational model and looks at crime as an outcome of the perception–choice process.

reflect social structure, personal traits, and place-based opportunities (Thodelius, 2016:64ff.). All in all, then, injury prevention needs to be re-thought so that it can acknowledge individuals as spatial and embodied actors to whom injuries occur in everyday life and not randomly.

### 2.3 Rethinking Injury Prevention: Making the Case for CPTED in Injury Prevention

In this dissertation, I attempt to develop a more systematic framework for the prevention work principles known as Injury Prevention through Environmental Design (IPTED). Although commonly applied in projects to promote safe design,<sup>7</sup> the IPTED concept has remained underdeveloped and un-theorized, and, as a result, also underused and ineffective in prevention work. The framing of IPTED is here performed through theoretical reduction and an adaptation of the core concepts of CPTED, indicating that also CPTED has potential as an injury prevention approach (cf. Ceccato, 2016; Pollack et al., 2014). While reducing and adapting CPTED is in itself nothing new in the health domain (see, e.g., Kent & Wheeler, 2016; Pollack et al. 2014), in this dissertation a greater emphasis is put on theorizing on the situational mechanisms, compared to the previous research. As I will argue, the key situational factors in crime events, as defined by Wikström (2006; 2011; 2014), are also relevant for injury events. In other words, situations always initiate action, provide alternatives, and influence the perceived alternatives. It is, however, important to stress here that, in injury situations, environmental features include an actant, one that either facilitates, hinders, or mediates the outcome of the situations (cf. Latour, 1996; Wortley & Mazarolle, 2008; Yaneva, 2009).

CPTED, as used in criminology, grew out of the situational crime prevention (SCP) perspective. As that connection implies, the approach focuses on situational elements in its attempt to contribute to the development of effective countermeasures. Influenced by architectural theory and praxis, the core concepts of the first-generation CPTED were influenced by the theoretical work of Jacobs (1961), Jeffrey (1971), and Newman (1972), along with the development of ‘defensible space architecture’. The second-generation CPTED paid more attention to also social aspects, including in it aspects such as socio-economic and demographic profiling related to the place dynamics (Cozens et al., 2005; Cozens & Love, 2015; Ekblom, 2011a), bringing to focus the use and function of place in crime occurrences. The third-generation of CPTED has integrated the three aspects of sustainability (economical, ecological, and social), moving from vulnerability-led planning and design to a more user-directed perspective by including activity-supportive design (Ceccato, 2016).

In Sweden, CPTED was introduced in the mid-1980s, with the publication of a Swedish National Council for Crime Prevention report on vandalism in residential areas (BRÅ, 1985). Nevertheless, the development and implementation of CPTED concepts were

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<sup>7</sup> See, e.g., the Auckland Design Manual at <http://content.aucklanddesignmanual.co.nz/project-type/parks/hub/civic-space/details/guidance/enjoy/sections/design-for-comfort-and-safety/Pages/default.aspx> and Flow: Transportation Specialists at <http://www.flownz.com/WhatWeDo/TransportEngineering/RoadSafety,CPTEDandIPTED.aspx> (accessed 12 April 2018).

delayed for several years: it was not until the late 1990s that the interest in CPTED began to increase in the country. The change in the concept's appeal coincided with some notable publications and initiatives, among them *Brott, bebyggelse och planering* (Crime, Buildings, and Planning) by the National Board of Housing, Building and Planning (in 1998), a doctoral dissertation on safe city and discourses of women's fear in research, policy development, and local practices (Listerborn, 2002), a manual issued by the police authority to aid crime prevention in residential areas, *BoTryggt05* (Stockholm County, 2005), and an evaluation report on CPTED published in the book chapter "Att bygga för trygghet – exemplet Sundbyberg" (Building for Safety: The Example of Sundbyberg; Grönlund, 2006). As an applied concept, CPTED is mainly related to the architect Cruse-Sondén's safety walks in the city of Gothenburg, premised on participation, and aimed at creating a dialogue based on observed problems and investigating possibilities for change in a specific area.<sup>8</sup> CPTED and other situational strategies have also been paid attention to by the national network Safe Places at KTH Royal Institute of Technology in Stockholm and its local sub-networks in Gothenburg (for an overview of CPTED in Sweden, see Landzelius & Thodelius, 2017:14ff.).

However, the theoretical foundations of CPTED tend to be vague overall, and they therefore show some limitations. There is, for instance, no discussion or systematic analysis of the causes of crime (cf. Armitage & Monchuck, 2017). My own interpretation regarding both crimes and injuries is that the events' causes can be determined by combining Routine Activity Theory (RAT; see Cohen & Felson, 1979) and Situational Action Theory (SAT; see Wikström, 2014). As I see it, RAT can explain causation on a macro level and SAT on a meso–micro level, and that CPTED, as a multi-faceted approach, can reduce deviance by combining theory and praxis. Accordingly, both crime and injuries can be approached as results of an interaction between individual dispositions and environmental factors, rendering opportunity an important trigger and situational factors a key source of meaning bestowed on the actions (cf. Clarke, 2009; Felson & Eckert, 2018).

In addition, working with CPTED also necessitates another unit of analysis when studying crime occurrence and explanations – *place*. As Sherman (1995) has noted, also the place can have a criminal career, with components analogous to criminal careers of individuals. Three important characteristics bearing upon the significance of place can be distinguished: site features (presence or absence of attractive targets/victims), possible clustering ('hotspots'), and facilitators/hinders of crime (degree of anonymity, extent of possibilities for confrontations or deviance thanks to absence of surveillance, extent of crime discouragement through guardianship, management, and handling, and so on) (cf. Eck & Weisburd, 1995; Felson, 1995). In other words, CPTED can be defined as a specific form of safe design or a set of place-based prevention strategies, one that is based on a systematic analysis of crime situations (cf. Cozens, Hillier, & Prescott, 2001).

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<sup>8</sup> For more on the safety walks, see the Swedish Crime Prevention Council's webpage <http://www.bra.se/nytt-fran-bra/arkiv/nyheter/2013-05-07-trygghetsvandringar-till-bra.html>, with an English-language fact sheet (accessed 21 June 2017).

Moreover, as research has shown, it has had a positive effect on crime occurrence when accompanied by properly implemented situational measures, resulting in a low degree of displacement and often also a diffusion of benefits (Clarke, 2009:269ff.; Clarke & Weisburd, 1994; Linden, 2007; Weisburd et al., 2017). It is unfortunate, therefore, that the concept is often poorly implemented, and also suffers from misconceptions that prevent the systematic putting into use of its core ideas (cf. Gibson & Johnson, 2016). As regards the implementation side, the applied version of CPTED, for instance, often stresses the territorial part, in terms of formal or mechanical surveillance (cf. Reynald, 2011; Welsh & Farrington, 2009:8ff.). These applied concepts are, moreover, also often ‘cookbook copied’ without taking the actual local environment into account (see Cozens, 2008; Ekblom, 2007, cited in Reynald, 2011).

CPTED, to be sure, is not one fixed solution, but depends on the social dynamics connected to the spatial dimension, in the sense of, say, which type of activity the actual place tends to attract and at which times (cf. Linden, 2007). Accordingly, any solution needs always to be tailored to the particular situation. This, however, does not exclude the possibility of modifying some of the general guidelines or manuals. Crime events have certain common elements to them and demonstrate similar processes (see, e.g., Atlas, 2013; Fennelly & Perry, 2014; van Soomeren & Woldendorp, 1997), and the same is true about injury prevention. Hence, to enable the formulation of suitable strategies and to avoid failures, one needs to develop both in-depth definitions and integrated concepts (cf. Ekblom, 2011a).

To take an example, Ekblom (2011a:11–12) has analysed different discourses of crime prevention and environment adapted to CPTED. Crime prevention may, for example, involve several different types of intervention (Ekblom, 2011a): functional interventions (rationale arises from the outcome, aiming at delivering prevention and safety), problem-oriented interventions (which are functional but tackle specific crimes in specific places such as thefts in a particular shopping mall), performance-oriented interventions (whose justification arises from meeting, or their aiming at meeting, certain output criteria such as the reduction of crime rates by a certain percentage amount), and/or mobilization interventions (campaigns to compel individuals to implement some preventive strategy such as buying and installing a private alarm system). Similarly, the discourse on environment and environmental design lacks generic terms to describe the fundamental qualities (causal properties in the environment) behind the entwinement of physical, psychological, and social elements.

In consequence, as Ekblom (2011a) has stressed, there is a need to distinguish between containment and movement space, perceivability and understandability (signage), as well as motivational and emotional influence and interpersonal or intergroup causality. In addition, one needs to define not only the aim or purpose of the intervention, but also the elements or qualities in the environment that are to be considered in relation to the intervention, in order to adapt the concept of causal mechanism for the third-generation CPTED (cf. Ekblom, 2011b:50) and be able to use CPTED as a method for analysing place itself in relation to security, safety, and the question of unequal access to (public) places in society (cf. Ceccato, 2016).

In this dissertation, CPTED is used not only as a methodological principle, but also as a two-headed strategy for injury reduction that relies on situational prevention and harm reduction. The difference between the two interrelated strategies is that situational prevention aims to prevent a situation or event from occurring (it is 'proactive'), whereas through harm reduction one aims to prevent or alleviate the consequences of the situation (it is 'reactive'). The former, proactive approach calls for a situational analysis focusing on the causes of a specific action in the situation and examining situational convergent elements (cf. Cornish & Clarke, 2003; Felson & Eckert, 2018; Wikström, 2014). The latter, reactive approach, instead of attempting to change the risky behaviour, focuses on minimizing the social and/or health consequences of the action or behaviour in question (cf. Stimson & O'Hare, 2010). This dual or twin character of the CPTED concept is connected to the distinction between unintentional and intentional injuries. Unintentional injuries result from behaviour and are therefore hard to address proactively (prevent), while intentional injuries result from action and therefore preventable using a proactive approach. Nonetheless, to be able to develop strategies based on the CPTED concept, the similarities and differences between crime and injuries need to be looked at more closely.

## 2.4 From CPTED to IPTED

Even if CPTED, then, can potentially be used as IPTED, there are still two things that first need to be elaborated on. On the one hand, the similarities and difference between crime and injuries need to be conceptualized, and, on the other hand, as Ekblom (2011a; 2011b) has reminded us, the applied definitions relating to prevention and environment have to be addressed in relation to actual cases.

As already noted, injuries are situated activities and similar to acts of crime: they occur as a consequence of everyday life. The routine activity approach in injury research, outlined by McCollum and others (2009), has certain similarities with the criminological explanatory model RAT (for the latter, see Cohen & Felson, 1979). This indicates that crime and injuries (along with all other forms of deviance) are intertwined with everyday life. In this dissertation, the convergence of critical factors in RAT, as Cohen and Felson (1979) analyse them in the crime context (motivated and able offender, suitable target, lack of suitable guardians), has been adapted to better suit injury research. The converging factors are now the following: a person with a high risk of experiencing an injury event (i.e., victim instead of offender), desirable (action) target, and absence of suitable guardians. Examples could include person X (likely injured person) who, hurrying to catch the bus (desirable action target), decides to cross the street at an unmarked spot (absence of a suitable guardian), or person Y (likely injured person) stumbling on the stairs on the way up to her or his apartment (desirable action target) in a poorly lit building (absence of a suitable guardian).

The most significant difference between an act of crime and an injury situation involves intention: crime always represents meaningful social action, and in that sense they are more related to intrapersonal and interpersonal injuries than unintentional injuries, which more often represent unforeseen consequences of everyday life (cf. McCollum et al., 2009). Conversely, there are more similarities between unintentional and interpersonal injuries and crime than there are with crime and intrapersonal injuries, at least at first glance. This

is mainly because unintentional and interpersonal injury events are very closely connected to lifestyle and routine activities. However, what I in addition want to argue is that also intrapersonal injuries are a consequence of lifestyle and routine activities. This we can see by making the distinction between obvious direct effects (in unintentional and interpersonal injuries) and more vague indirect effects (in intrapersonal injuries) connected to routine activities and lifestyle. This is more obvious if we include the possibility that intrapersonal injuries may come about as a reaction to strain. Strain can be understood as a stressor, involving, for instance, the inability to achieve culturally or socially valued goals and absence of positive stimuli or presence of negative stimuli, which can be either subjective or objective in nature (Agnew, 2009).<sup>9</sup> In Agnew's (1985, 2009) definition of it, reaction to strain is pain-avoidance behaviour that under certain circumstances can result in deviance, with the individual's reaction or the timing of the response depending on personal traits and the character of the strain. This definition brings to mind SAT, since the intersection between individual predisposition and situational elements is central to it. This way, interpreting intrapersonal injuries as a response to strain helps to elucidate their relation to lifestyle and routine activity.

Nevertheless, even if there are differences between crime and injuries in general, and also between different types of injuries, the main characteristics of injuries seem to be similar to crime events, mainly because the absence of a suitable guardian is prominent in both (see Table 2).

Table 2. Similarities and differences between crime events and injury events.

		Elements of crime events				
Elements of injury events		<i>Motivated offender</i>	<i>Suitable target</i>	<i>Absence of suitable guardian</i>	<i>Intention</i>	<i>Explanatory framework</i>
	<i>In unintentional injuries:</i>	Translated to prospective victim	Translated to desirable action target	Absence of suitable guardian	None (Behaviour)	RAT
	<i>In interpersonal injuries:</i>	Translated to prospective victim	Translated to desirable action target	Absence of suitable guardian	Intention (Action)	RAT, SAT
	<i>In intrapersonal injuries:</i>	Translated to prospective victim	Translated to pain avoidance as target	Absence of suitable guardian	Intention (Action)	SAT

Suitable guardians are understood here not only as formal guardians, but also as technical, built, or design-invented guardians such as fencing, lighting, and barriers, although they

<sup>9</sup> Objective strain Agnew (2009) defines as events or conditions disliked by most members in the group, while subjective strain is about conditions disliked by individuals experiencing them.

can also be informal such as in the case of neighbours or friends (cf. Skubak Tillyer & Eck, 2011). Recognition of the importance of this factor, the absence of a suitable guardian, is also central to CPTED, and, indeed, most of the CPTED concepts are developed and designed so as to create or facilitate suitable guardians (guardians, managers, or handlers in situ).

These guardians, however, still need to be positioned in their context to enable their analysis. In addition, also the design of the measurements, as well as the definitions applied to situations, prevention, and environment, needs to be addressed. In this dissertation, injuries are approached as situated activity occurring in residential situations, schooling situations, and suicidal situations to individuals who are both spatial and embodied actors, given that the situation, in situ, is the result of the event, time, and location coming together (cf. Dale & Burrell, 2008; Gromark, 2006:31). For this reason, IPTED also needs to be specified in relation to intervention discourse, space characteristic, causal properties, and design discourse (concerning the distinction between design as a product/artefact and design as process). As seen in Table 3, there is, in the sub-studies, variation between different aspects of the interventions, owing not only to the internal differences between injury types, but also to methodological and empirical conditions.

Table 3. The operationalization of CPTED elements into IPTED in this dissertation (based on Ekblom, 2011a, 2011b)

	<b>First Sub-Study: Injuries in residential situations</b>	<b>Second Sub-Study: Interpersonal injuries in school situations</b>	<b>Third Sub-Study: Suicidal situations</b>
<i>Intervention discourse</i>	Technical/structural	Mechanistic	Problem-oriented
<i>Type of space</i>	Containment and capsuled space	Capsuled space	Movement space
<i>Causal properties in the environment</i>	Mechanic elements	Precipitate elements	Precipitate elements
<i>Intervention aim</i>	Proactive and reactive Safety and security	Proactive Security	Proactive Security
<i>Design discourse</i>	Process	Process	Process

Interventions are defined as technical/structural in the first sub-study in this dissertation, mechanistic in the second one, and problem-oriented in the third. Thus the interventions target different aspects of causation, they are implemented in different types of space, they target different situational elements, and they have different aims. The technical/structural intervention is focused on the intervention as a practical method (how injuries can be reduced by design, identification of feasible harm-reducing methods). The mechanistic intervention is more focused on how the interventions should work (how interpersonal injuries can be discouraged). Finally, the problem-oriented intervention is focused on a

specific injury in a specific place or specific places (how to prevent suicidal situations in place X).

The same way, the sub-studies also include three different forms of space characteristic; containment space, defined as containing individuals and artefacts (e.g., home); capsuled space, defined as bounded locations in which individuals are brought together for a specific purpose (e.g., an institution); and movement space, defined as property allowing individuals or artefacts to be moved. The elements of interest in regard to the environment are defined as mechanic or precipitate elements. The former are about interaction between different elements influencing the probability of occurrence, whether indirectly or directly, whereas the latter play a more causal and direct role in the occurrence.<sup>10</sup>

While we have already discussed the distinction between ‘proactive’ and ‘reactive’ aims, the one between safety and security needs still to be addressed. My own interpretation is that, compared to ‘security’, ‘safety’ is more about a subjective feeling or an emotional state related primarily to socially constructed risks. Security is then more ‘defensive’, being aimed at protecting one from some rational and measurable threat, and is mainly related to social and probabilistic risks (see also Landzelius, 2017:15ff.). Consequently, the main aim in the first sub-study was to develop interventions bringing increased safety and security, through the adoption of both a proactive and a reactive approach, while in sub-studies no. 2 and 3 the interventions are proactive and have a security focus.

In contrast to CPTED in general, ‘design discourse’ in this dissertation is understood as a process, even if users of CPTED tend to put an emphasis on the product rather than the process (Ekblom, 2011a). Design as a process can be described as iterative and as something taking place interactively, and even if this dissertation research concerned itself with architectural performance, its results can be adapted or more directly allowed to bear upon requirements pertaining to different stages of the design process (cf. Ekblom, 2011b:48). Design, as a problem-solving process, also necessitates dealing with the ‘real world’ and complexity, and so it cannot rely on tacit knowledge only: such knowledge might hinder the innovative process and the tackling of new, complex problems in new or changing contexts (cf. Ekblom, 2011b).

## 2.5 Mechanism, Matters, and Mattering: A Summary of the Theoretical Model

The theoretical framework of this dissertation is developed in a boundary-transgressing (interdisciplinary, transdisciplinary) operation intertwining architectural theories of space, place, and human–environment interaction, sociological theories of situated interaction, and criminological theories concerning place-based prevention, causal factors and mechanisms (Figure 5). To the extent that its framework, even when it is adaptive and the result of a synthesis, is coherent, theory can function as a complexity reducer in any systematic inquiry into multifaceted problem of injury events, framing configurations of causal factors and integrating them into a cumulative framework (cf. Ekblom, 2011b:48ff.).

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<sup>10</sup> The adaption and operationalizing of these aspects in this dissertation is based on Ekblom (2011a) and Wortley and Mazarolle (2008).



In this dissertation, the most important theoretical aspects are related to the understanding of situational dynamics, or the task of defining injury events as explainable and situated rather than random and unpreventable, through the recognition of the role of space and place in prevention work.

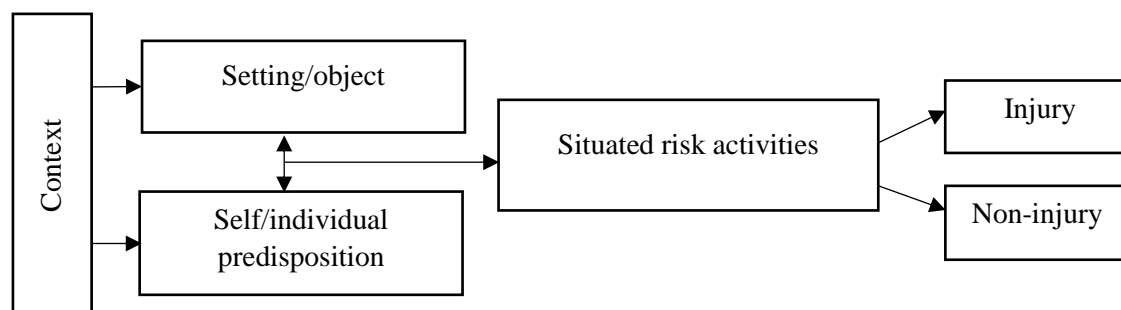


Figure 5. Relationship between context, object, and individual predisposition in the creation of injury events.

As Collins (2004) has argued, every situation involves a re-call of previous experience of similar situations, which then conditions the new situation. Our social position and habitus influence our predisposition for injury events, or, for particular socio-spatial practices, through the way we interpret situations and through our pre-disposition and our situational processes of choice (cf. Bourdieu, 1977, 1986; Merton, 1938; Wikström, 2011). In keeping with this basic observation, the analysis in this dissertation is conducted with an emphasis on proximal cause, with causal components, causal configurations, and integrated intervention principles systematically described in the context (cf. Ekblom, 2011b; Wikström, 2006, 2014). This way, the socio-spatial element, too, is related to injury events directly, as part of our everyday life. Injury events occur on a meso level at which micro and macro influences converge through the environment–human interaction, constituting that everyday life (cf. Agnew, 2001; Cohen & Felson, 1979; Mead, 1932).

Moreover, by interweaving the two perspectives (macro and micro), socio-spatial practices overall can be made more easily identifiable and graspable. Place then emerges as a physical framing for situated activities creating either opportunities or lost opportunities, for different kinds and types of events (cf. Goffman, 1963; Lefebvre, 1991; Merton, 1959). The spatiality constructed in a perceived space produces a specific meaning for the particular sort of a social space (Dale & Burrell, 2008:9), of which individuals become aware as a ‘place’. This process then forms an important context for everyday life, calling for research on contemporary phenomena to interrelate objective space as place (where X occurs) with temporality (when X occurs) and social structure (how and why X occurs), so that it can contribute to an improved understanding and explanation of these phenomena (cf. Toneboe, 1993:523, 531ff.).

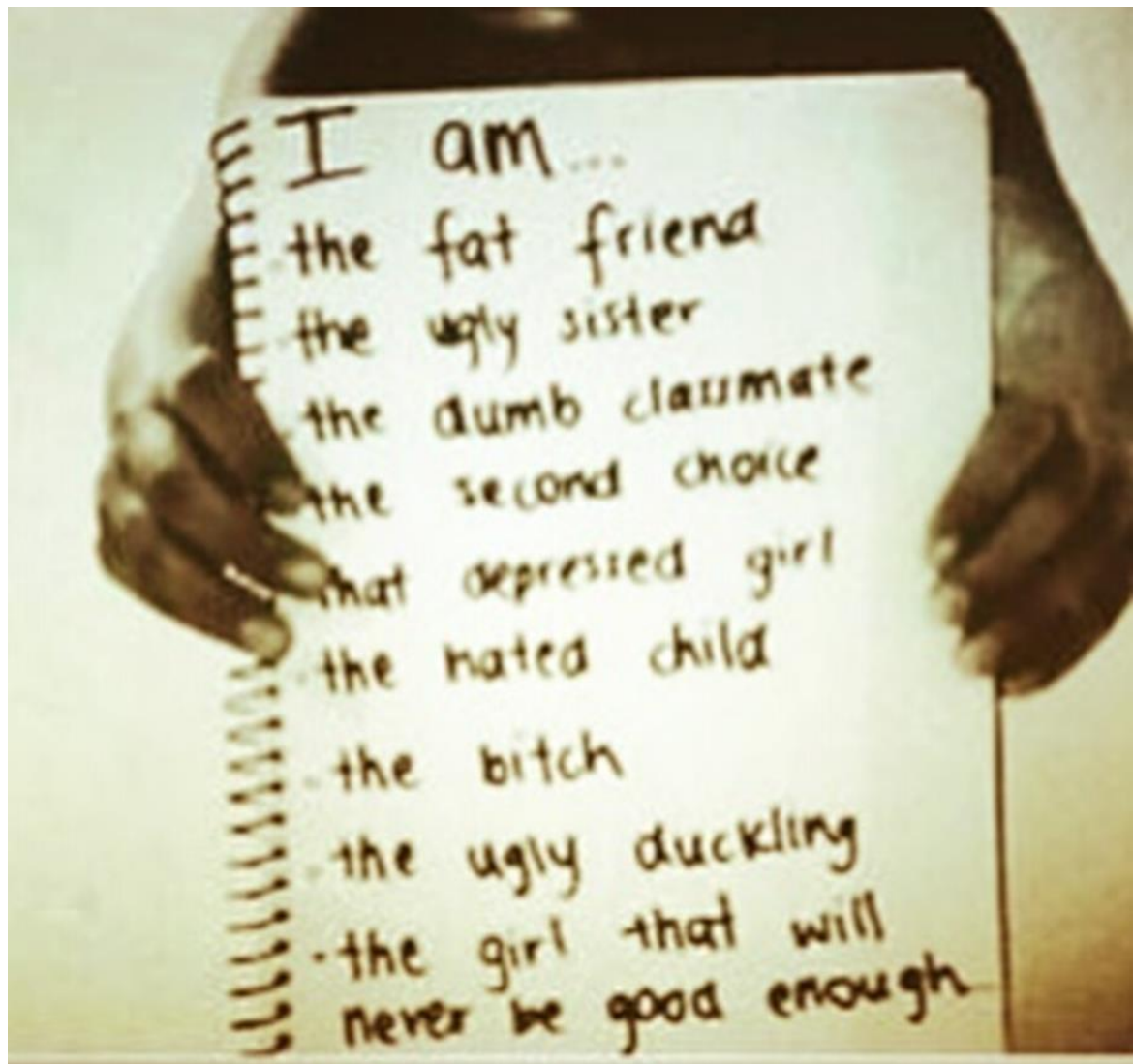


Figure 6. Facebook entry by Girl A, tagged 'how do i start the blue whale suicide game' (accessed 19 July 2017). From the Sub-Study No. 3 on suicidal events.

### 3. DATA AND METHODS

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As suggested earlier, the research resulting in this dissertation can be understood as having had the character of a dual process with a mutual feedback mechanism built in between the two processes. As a result, two different methodological approaches' could be applied to the same cases, throughout the entire undertaking.

The first of the two processes in question was based on the theoretical framework presented above. It took the form of an analysis carried out at a general, abstract level and aimed at promoting theoretical and methodological development. This operation was carried out mainly by merging and adapting architectural, sociological, and criminological theories to fit an injury context, by emphasizing the social and physical context, emerging patterns, immediate causes, as well as conditional risks and protective factors in injury events (cf. Ekblom, 2011b:177ff.). The theoretical work here was geared towards constructing an explanatory middle-range theory (MRT) for injury events. To predict and explain a phenomenon, MRT integrates theoretical and empirical research, moving somewhere between 'minor working hypotheses of everyday life' and 'all-inclusive grand theories' (Glaser & Strauss, 2012:31–32; Merton, 1968). Methodologically, the work done aimed at a more systematic situational analysis than what is normally possible in architectural research. In this attempt, space (and place) formed an important context for everyday life (cf. Dale & Burrell, 2008; Gromark, 2006:31; Toneboe, 1993:523, 531ff.). Accordingly, the influence of the immediate environment had to be addressed, identifying any causal properties and defining the space in injury events.<sup>11</sup>

The second one of the two processes combining in this research aimed at the development of comprehensible prevention strategies based on the cases and the empirical material studied. This part of the work resembled what Ekblom has defined as 'interventions' (2011b:181ff.). 'Interventions' as a research outcome (in this dissertation taking the form of recommendations for well-functioning and effective prevention strategies) are premised on understanding injury events by linking causes, mechanisms, and contexts with the intervention mechanisms; they can be described in terms of purpose, generic principle, detailed mechanism, and method (cf. Ekblom 2011b:187–89).

In both of these two processes, the concept of a mechanism is essential. A mechanism can be defined as an organized configuration of components, describing a process and events that are represented by entities, activity, and interaction (Edling & Rydgren, 2014). This dissertation's interest in mechanisms and the concept of emergence link it to the tradition of analytical sociology (AS). The latter can be briefly summarized as a paradigm emphasizing the importance of integrating theoretical and empirical work, without adhering to any specific research methodology; instead, in the design of the empirical research it is seen as imperative to combine stringency and theoretical imagination (Hedström & Ylikoski, 2010:21, 36).

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<sup>11</sup> For a similar discussion about crime, see Ekblom, 2011b; Felson & Eckert, 2018; Wikström, 2006, 2014.

### 3.1 Research Design

The research design in this work was based on Layder's (1993) multi-strategic research strategy. This approach was chosen since it is appropriate for development of MRT and facilitates analysis of 'mechanism' on different levels, while also allowing the integration of theoretical and empirical analysis in a manner suitable for AS. Furthermore, this design has worked well for research conducted with mixed method (MM) using an abductive approach. The starting point of Layder's strategy is the assumption that the social world is framed and interconnected in stratified 'realities', and that the research design should integrate four different research elements that interact in situations, namely the context, the setting, the situated activity, and the self (Layder, 1993:72, 114). My decision to adopt Layder's research strategy was based on the assumption that it is not possible to discern and differentiate between different research elements in reality, only on an analytical level, since the elements are integrated into the practice of everyday life (see Table 5 for an outline of the research strategy adopted in relation to the sub-studies conducted). Even if there is no clear boundary line between the setting and the context, contexts differ from settings by virtue of their characteristic scale: they have specific large-scale, even society-wide, features. Settings, in contrast, can be defined as immediate arenas for social activity that are constituted by contextual characteristics. Situated activity, for its part, is the dynamics of social interaction and action defined as process, while the self is the element in which individuals' relationship to their social environment is researched, with emphasis on the kind of strategies and techniques used in situations (Layder, 1993:107ff.).

However, as stressed by Layder (1993:38ff., 109 ff., 112), there is also a need to apply a Mixed Method approach in research, since the simultaneous use of qualitative and quantitative data challenges the micro-macro division and the distinction between positivistic social science and small-n studies on agency. In this dissertation the MM approach was used to create a bridge linking the 'how' to the 'why' (cf. Clarke et al., 2015:13ff.; Katz, 2001). This was attempted, first of all, by exploring or mapping patterns, frequencies, and statistical characteristics of injury events, and, secondly, by explaining the causal factors involved in the events, along with traceable situational factors. As Creswell (2014:228) has noted, MM can be used in different ways in research. For this dissertation, MM was used as single methods complementing one another to achieve a single purpose for the multiple projects, with the methods and data as applied in the sub-studies chosen based on the research problem and the availability and accessibility of data (Layder, 1993:107). Similarly, the research design permitted and encouraged abductive reasoning, in which theory functions as a guide for research while also being the object of research. In abduction, a known unit (e.g., an outcome) is related to two unknown units (e.g., a rule and a case) using a specific logical calculus to support or confirm an explanation (Burch, 2017; Riechertz, 2010). The first step of abduction is hypothesis-generating, with the hypothesis then tested in a second step using deductive logic (e.g., through the derivation of predictors or an interrogation of the relationship between the explanans and the explanandum). In a third step, inductive logic was applied to examine elements potentially explaining the emerged relationships (see Burch, 2017; Hempel & Oppenheim, 1948; Reichertz, 2010).

Table 4. The research design applied in the dissertation (derived from Layder 1993:72, 114), with the relevant data type and the corresponding sub-study.

<b>Research elements</b>	<b>Research focus</b>	<b>Type of data</b>	<b>Applied in sub-study no.</b>
<b>Context</b>	Social and economic organization of everyday life.	Quantitative: Combination of health records and demographic data as aggregate of individuals in specific social circumstances.	1
<b>Setting</b>	Socio-spatial framing of everyday life.	Quantitative: Simple forms of numerical analysis (frequency, cross tabulation, etc.) applied to health records and other official data.  Qualitative data: Interpretive data, documents, interviews, and research circles.	1, 2, 3
<b>Situated activity</b>	Social activity affected by the context and the settings as well as the subjective disposition of the 'self'.	Qualitative data: Interviews, workshops, participation observations and informal conversations.	2, 3
<b>Self</b>	Self-identity and individuals' social experience.	Qualitative data: Informal conversations, linguistic features in discourse and online narratives	2, 3

### 3.2 Data and Data Collection

The data used for this research represented a combination of qualitative and quantitative data classified as either primary or secondary in character. The classification was based on the data collection: the data collected specifically for the purposes of this dissertation was termed primary, while that originally collected for other purposes was designated as secondary even if it was used in new ways and for new purposes in the dissertation. As Charmaz (2014:26) has noted, not only the quality of the data is of importance, also the collection is: ‘how you collect data affects which phenomena you will see, how, when, where you will view them, and what sense you will make of them’. In this section, I first discuss the qualitative data and data collection, followed by a description of the quantitative data and its collection.

The primary qualitative data in this dissertation consists of interviews, personal narratives, online narratives, and observations. The secondary qualitative data consists of different documents. The interviews were semi-structured, featuring a topical approach (see Patton, 2002). By structuring the interviews around themes (e.g., ‘Where?’ ‘Who?’ ‘Why?’), the aim was to capture the interviewees’ personal experiences, in order to enable what Kvale (1996:2) has called the ‘construction site of knowledge’. Following their interviews, the participants read the transcripts of their particular session, along with the analyses made of them by this author, entering clarifications, corrections, and additions where needed.

The personal narratives, which could also be described as the participants’ individual experience, were collected through research circles. Such circles, as a data collection method, share some features with focus groups interviews: in both, knowledge is obtained in discussions around topics of mutual interest and of the interviewees’ experiences (Kvale & Brinkman, 2009:2). However, the two also differ in some key ways, in that research circle participants have an active role in the research being conducted, influencing every step of the research process over a longer period of time (Niemi Kristofferson, 2014). Research circles can be thus seen as a form of emancipatory research and joint knowledge production aiming to make the objects of research into its co-authors (cf. Wermeling & Nydahl, 2011).

The online narratives, in the form of pictures, movies, and texts, were collected on the Internet using specific search strings and keywords. The majority of the data here was collected through Social Media 2.0, and therefore defined as public (cf. Zimmerman, 2010). Due to the special qualities of online narratives, this type of data was also the hardest to handle, being empirical, emotional, and ethically challenging. At the same time, it contributed to the research by underlining the subjective rationalizations and motive vocabularies connected to chosen actions and people’s relationships to ‘place’.<sup>12</sup> Since online narratives often present individuals’ own understanding of their motives and rationale for (their own accounts and justifications of) the event in which they were or are involved, and are therefore important material for any research aiming to produce in-depth knowledge of a phenomenon (see Lindgren & Thodelius, 2017; Thodelius, 2017).

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<sup>12</sup> Thus, even if the narratives were produced and communicated online, the events themselves took place in physical places, such as a particular school or a certain suicide site.

The observations varied in terms of the degree of involvement of those observed and the intensity and extent of the observing itself, depending on the purpose and site of the observation each time (cf. Marshall & Rossman, 2011:140ff.). The more systematic observations for the most part concerned artefacts (built environment) and interactions around these, and with the observations recorded in field notes (cf. DeWalt & DeWalt, 2010; Emerson, Fretz & Shaw, 1995:19).

All the documents gathered were defined as secondary data, and they consisted of official reports (by the government, an administrative authority, or an interest organization), policy documents, judicial investigations and court documents (by administrative courts, district courts, and appellate courts). These data were used for their richness of information, but also for their ability to portray relevant values and beliefs (cf. Marshall & Rossman, 2011:160).

As for the quantitative data collected, all of it was secondary data, consisting of different health records, demographic data, and residential data. There were some limitations to it that are worth noting. For my licentiate thesis, I conducted an evaluation of the same data set, with the main finding being that, since the records included in it were developed for epidemiological research, and also collected for that, they would only be of limited value for the kind of research conducted for this dissertation. The data in them lacked certain variables relevant in situational analysis, making it not readily suitable for explanatory research, and owing to this circumstance, the research questions would then have to be adapted to fit the data, instead of finding data responding to the research question (Thodelius, 2016:35ff.).

For this dissertation research, the Swedish quantitative data drawn upon included data from IDB (Injury Data Base) Sweden, the in-patient registry Patientregistret (PAR), and the cause-of-death registry Dödsorsaksregistret (DOR), along with demographic data, geographic Small Areas for Market Statistics (SAMS) data, and residential data (e.g., type, size, and construction year) obtained from Statistics Sweden (SCB). The three health information registries IDB, PAR, and DOR were anonymized by these registry administrator, The National Board of Health and Welfare, with any social security numbers replaced with random individual numbers enabling this data set's merger with the other statistical data sets.

In any case, this data differed somewhat from registry to registry in terms its size, geographical coverage, and time period. The IDB database, for example, only covered approximately seven per cent of the country's population, with number of the Swedish counties participating in it varying over time. For the purposes of the three sub-studies in this dissertation, IDB data was available for the following counties and cities: Skaraborg (2001–2013), Värmland (2007–2008), the city of Uppsala (2013), and the city of Umeå (2001–2013). The most specific data set of the three different health registries drawn upon, IDB, includes the following variables: injury date, injury time, age, gender, municipality, hospital, date and time of visit, date of discharge, type of injury, injured body part, ICD treatment, injury site, injury site (indoors/outdoors), injury mechanism, activity, causative product, triggering product, other product that contributed to the injury event, and free-text

forms describing the event. PAR and DOR are both national registries, containing data from the period 1990 through 2013.

The PAR and DOR samples included all units with the ICD code W00–W19 (falls), W20–W49 (mechanical exposure non-living), W50–W64 (mechanical exposure living), X40–X49 (intoxication–accidental exposure), X60–X84 (deliberated self-harm), X85–Y09 (abuse), and Y40–Y59 (adverse effects of drugs and biological substances in therapeutic use).<sup>13</sup> PAR included the variables patient's gender, age, date of hospitalization and discharge, country of birth, citizenship, enrolment method, diagnosis (according to ICD), diagnosis-related grouping, external cause code (1–5), indicated main diagnosis, and reported treatment in the hospital. DOR included the patient's date of death, gender, age at death, marital status, country of birth, contributing underlying cause of death, cause of death, possible alcohol or drug-related diagnosis as a contributing/underlying cause of death, possible intent on injury, initial disease or injury causing the death.

According to The National Board of Health and Welfare (2015a, 2015b), the quality of IDB, PAR, and DOR is generally good. In IDB, data loss is less than ten per cent, and in PAR only fewer than one per cent of the cases have no entry for the variable main diagnosis. In DOR this is the case for seven per cent in the variable direct cause of death.

### 3.3 Data and Analytical Techniques Used in the Sub-Studies

The collected data was triangulated in different combinations for the three sub-studies. In addition, a different design and different analytical techniques were used each time. This section gives an overview of the different analytical techniques applied in the sub-studies.

**Sub-Study No. 1**, focusing on injuries in residential situations, relied on several different analytical strategies, utilizing statistical analysis, a mixed method analysis, and qualitative analysis. All in all, five different analyses were conducted, all with a focus on unintentional injuries in residential settings. All the analyses aimed to highlight at least some of the aspects of the triadic relationship adolescents–built environments–injuries, to capture underlying mechanism and emergence.

In the first and second analysis, the quantitative data were subjected to logistic regression (cf. Krishnapuram et al., 2005; Kwak & Clayton-Matthews, 2002) and multilevel Poisson regression, based on IDB, PAR, and DOR, along with demographic data and residential data from Statistics Sweden. Logistic regression was used since the dependent variable was dichotomous (cf. Kwak & Clayton-Matthews, 2002). The multilevel Poisson regression model was used here, since the dependent variable was a count variable (injury events per year) and the model estimated the conditional effect of a number independent variables of the individual, the household, the local area and the region. The third analysis was conducted as a single-case study of the residential institutions, based on a selection of IDB data and combining descriptive statistics and a qualitative content analysis to explore the distribution and frequencies of injury events and their traceable situational elements (see, e.g., Nolan & Heinzen, 2014:23ff.).

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<sup>13</sup> ICD is an international classification developed by WHO in 1992. For this study, however, it was mainly the Swedish version published by The National Board of Health and Welfare (2018) that was used.



The fourth and fifth analyses in this sub-study relied on qualitative data collected through two research circles with participants from disability organizations and patient associations (n=10), and a document analysis of court documents (n=53). The data collection in the first of the two research circles was mainly carried out using photovoice (see Casteleden & Garvin, 2008; Wang & Burris, 1997). The photos were taken by the participants and discussed during the sessions, with the discussions recorded, transcribed, and analysed according to the principles of grounded theory, focusing on experience and action. The coding was done in three steps: initial coding, focused coding, and axial coding aiming for abstraction and ability to explain the observed patterns (cf. Charmaz, 2014). The process was completed between the research circle sessions, whose contents, along with the results of the coding, were discussed, reformulated, and finalized in the session that followed. The aim of the second research circle was different from that of the first circle, since the participants wanted to focus more on their experience of, and risks related to, the (lack of) mobility/disability aids and the low degree of information about disability rights and pertinent human rights. This research circle was therefore more than the first one focused on finding information and on work within disability advocacy organizations.

The analysis of court documents related to denied applications for home adaptations, with the materials obtained from the Court of Appeal in Gothenburg, covering the years 2010–2016. The cases came from the following counties: Halland, Skåne, Värmland, Örebro, Västra Götaland, and Swedish authorities abroad. The analysis was conducted with a mixed method approach based on a deductive coding; that is, the documents were coded and categorized according to gender, age, room, type of adaption, and dwelling situation, using descriptive statistics and cross tabulations. To map relational factors in the court decisions based on the fixed categories above, a qualitative content analysis was then performed, by coding the reasons communicated by the appellate court for its decisions in each case (cf. Krippendorff, 1980).

**Sub-Study No. 2** analysed interpersonal injuries in school situations, narrowing down the precipitate elements to a single-case study with multiple units of analysis (cf. Yin, 2007:60ff.), with the analysis carried out using two different techniques: content analysis and pattern matching. The qualitative content analysis used deductive coding (categorizations and thematization) to enable within-case and cross-case analysis (cf. Creswell, 2014; Ducheyne, 2008; Krippendorff, 1980; Schofield, 2000; Yin, 2014). Pattern matching was then performed based on hermeneutic interpretation, following the logic of case-oriented theory testing (see Ragin & Schneider, 2011:152; Yin, 2014).

For this study, data was collected through a research circle aiming to comprehend the pre-requisites for a safe and secure school (10 participants and seven meetings), using observations from two different schools in the city of Gothenburg and its vicinity along with various types of documents (n=22). The collected data was used as textual material, coded and categorized along different elements (e.g., place, time, event, persons involved) and then interpreted hermeneutically, meaning that none of the units could be interpreted out of its context. Thus, in this work there was a necessary alternation between the units

and their context, allowing an understanding of the event to emerge (cf. Alvesson & Sköldberg, 2008:239ff.).

This approach was undeniably more deductive than abductive in nature, since the categorization used in the analysis was defined by theoretical constructs based on previous research. The design, however, was also flexible enough to allow the gradual addition of other concepts and theories (cf. Rule & Vaughan, 2015). The research design and the interpretive approach then enabled a more situation-oriented analysis, since the reduction of patterns resulting in different events enabled an analysis of situational control and situational transformation (cf. Katz, 1988; Tittle, 2001).

**Sub-Study No. 3** was designed to analyse intrapersonal injuries in suicidal situations. Using techniques derived from grounded theory, it addressed actions as social processes, exploring patterns and general paradigms with the help of iterative logic in the comparison of code with code (cf. Charmaz, 2008:403, 2014:13; Clarke et al., 2015; Strauss & Corbin, 1990:99). Grounded theory is both explorative and interpretative in nature while at the same time regulated by logical rules, such as those having to do with framing the research question, deconstructing and analysing prior conceptions of the phenomena, as well as situating, bracketing, constructing, and contextualizing the phenomenon in question (Denzin, 2002:349ff.). According to it, the analysis should not only explain, but also describe the phenomenon, by uncovering relevant conditions and determining the actors' response to the conditions of, and consequences for, their actions understood as interplay (Corbin & Strauss, 1990). Yet, its ability to facilitate systematic analysis does not mean that grounded theory would represent a linear process; rather the contrary. As, among others, Orona (2002:374) has noted, 'the beauty of and the strength of grounded theory approach is that it is not linear'.

The development of typologies here was not only to enable theorizing, but also because, as Layder has put it, 'by working with typologies the researcher works with a clear analytic objective' (1993:137ff.). The typologies were constructed by constantly comparing interpreted patterns and the variations in the data (cf. Charmaz, 2014:132ff.; Corbin & Strauss, 1990; Ragin 2014:12ff.), with all types defined by combining attributes. However, not only empirical correlations had to exist between single properties: there also needed to be a meaningful relationship between them.

The data used in this sub-study consisted of expert interviews with so called first responders (employees at police and rescue service in the greater Gothenburg area; n=7), observation of four named hotspots (40 hours), and online narratives from persons streaming or visualizing through text and pictures their suicide or suicidal attempts, downloaded from open-access websites such as YouTube and Twitter (n=12).<sup>14</sup> The interviews and the field notes were transcribed and analysed in a three-step process of coding – initial, focused, and axial. While the coding process was similar for the online narratives, the process of transcription in their case was slightly different. Online narratives in general capture self-representations, motive vocabularies, accounts, and different sets of neutralization

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<sup>14</sup> The online narratives thus did not require any kind of membership or interaction to access. This material contains cases from Sweden, England and U.S.

techniques (Goffman, 2006; Mills, 1940; Scott & Lyman, 1968; Sykes & Matza, 1957), omitting the experience of place variables, on which the interviews and the observation in this study were mainly focused. The online material was in this study defined as ‘one-way observations’ (Layder, 1993:115–16) that then were transcribed descriptively, including gestures, significant symbols, and emotional expressions (cf. Collins, 2008:5). The films in the data set were given a verbal transcription and treated as textual material used for analysing manifest and latent elements in situational difficulties and candidate solutions (cf. Redley, 2003).

### 3.4 Ethical Reflections

When researching this dissertation and, subsequently, writing the articles included in it, several ethical considerations and decisions had to be addressed. In briefly summarizing the most important ones among these, it is good to keep in mind that an ethical stance is about how to ‘manage’ not just external relations, but also internal relations, the general obligations of the researcher, and the presentation of the results (cf. Tracy, 2010). Besides obtaining for this research the approval of the regional ethical review board in Gothenburg (registry number 464-14) and adhering to the recommendations of the Swedish Research Council regarding the need for informed consent, anonymization, and confidentiality in research (2011), I also incorporated into it some aspects of the CUDOS principles (communism–universalism–disinterestedness–organized scepticism) as defined by Merton (1973).

As Merton notes in his definition of communism, the academic community as a whole benefits from research when its results are not regarded as some individual’s intellectual property, and the scientific ethos is acknowledged. This is something that is ‘naturally’ facilitated when the research in question is of interdisciplinary nature. On the other hand, however, the same is not automatically true about projects carried out by groups, since collaboration often relies on an assumption of shared values concerning the ethical aspects of research, the research objectives, and so on (cf. Kovacs, 2017; Smith, 1994; Swedish Research Council, 2011:72ff.; Thodelius & Lundälv, 2016). In addition, one might also argue that Merton’s type of ‘communism’ needs to be broadened so as to include the society as whole, not just the academic community. This is mainly because, as Angelstam and collaborators (2013) have observed, interdisciplinary research always seeks to become implemented in ‘the real world’, based on ‘real needs’. This utilization is also acknowledged in the Swedish Higher Education Act (1992:1434, Ch. 1, §5), which concludes that research ought to lead to sustainable social development and give something back to society. At the same time, there is a fine line separating the utilization of research results in society from ‘the arrogance of public sociology’ (Tittle, 2004). In other words, there is often a risk that, by attempting to be populist or generate knowledge that just affirms the public view, research merely shoots itself in the foot. Consequently, I have tried to find, on this issue, a balance where interdisciplinary and transdisciplinary research and academic publications are combined with public activities (cf. Björk, 2018).

Also the question of universalism was addressed by Merton (1973). For him, research is to be based on scientific criteria and not personal beliefs or socio-political attributes. It is, so

to speak, to be conducted with the personal morality in parentheses, applying transparency throughout all the steps of the research process and with a second person checking the qualitative analysis and its results, to avoid personal bias (Creswell & Miller, 2000; Tracy, 2010). Merton's concept of disinterestedness is important for knowledge production, calling for avoidance of self-gain in the conducted research and re-connecting to the principle of universalism through its proposed altruism. Finally, organized scepticism, for Merton, is a principle stressing the importance of critical scrutiny and validation, entailing questioning, reviewing, and avoidance of hasty conclusions about the research outcome. This is similar to Ekblom's (2011b:220ff.) notion of 'involvement', albeit on a scale that is smaller than what Ekblom suggested for it. The acknowledgement of involvement is in this dissertation's framework related to its transdisciplinary position, to its application (to varying degrees) of the principles participatory research, and to member validation.

Lastly, in Sub-Study No. 1, the quantitative materials were analysed on an aggregate level to lower the risk for stigmatization on the part of certain groups, institutions, and geographical areas. Moreover, as already noted, the quantitative data sets were anonymized by the registry keeper, with the result that the individuals in these sets are not identifiable by either the researcher or the readers of her research reports. Also the qualitative materials used in Sub-Study No. 1 were anonymized, even though they focused, not on any persons per se, but on situations, strategies, and (absence) resources to avoid injury events or risky situations. In Sub-Study No. 2, too, the qualitative materials were anonymized, as regards both the analysed documents and the materials collected through the research circles. In addition, the research circles participants acted as 'experts' when discussing their experiences and previous attempts to address violence in schools with different means. Accordingly, in this sub-study, knowledge exchange and knowledge production were the aims, making processes and partnerships an important tool in prevention work. In Sub-Study No. 3, anonymization was especially important, since reports of suicides can act as triggers for other suicidal individuals – the so-called Werther effect. For this reason, I anonymized not only the research participants, but also the places where the observations were conducted, photoshopping, moreover, the photos published in this introductory chapter to ensure their anonymity. Finally, the Internet materials in this dissertation have all been classified as official publications (cf. Uhnöo & Ekbrand, 2017) and they were thus anonymized the same way as ordinary documents.

## PART TWO: RESULTS

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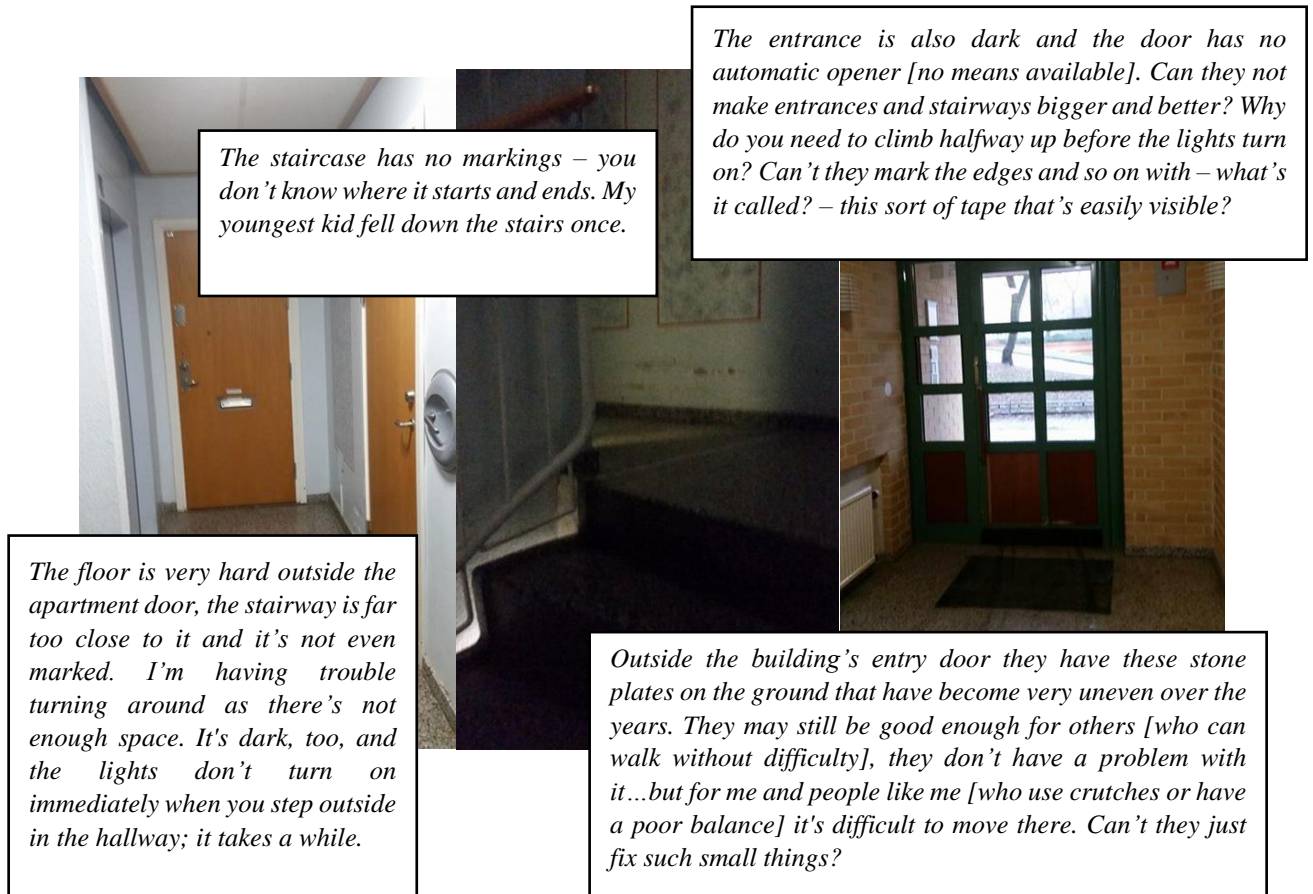


Figure 7. Photos and narratives describing the way from an apartment to the outside yard (Sub-Study No. 1 on risky situations and risk management, photovoice session dated 19 February 2016).

#### 4. CONTEXTUALISING THE DISSERTATION AGAINST PREVIOUS STUDIES

Before presenting the results from this dissertation research, they need to be briefly contextualized against previous findings in the field of injury research and injury prevention. Indeed, there is a relatively large body of literature addressing itself to both injury risks and injury prevention from different disciplinary perspectives. In this section, my aim is nevertheless not to provide a comprehensive picture of the state of research in the field. Rather, the focus is on that which research in the field has been able to establish regarding any everyday injury risks and their prevention.

##### 4.1 Literature Review I: Everyday Injury Risks

The field of injury risks is quite broad, for which reason it seems sensible to delimit the examination. Here the three factors in focus that influence risks are: individual traits, immediate social and physical environment, and structural factors related to adolescents. I discuss these below in relation to injuries in residential settings, interpersonal injuries at school, and suicides.

##### *Injuries in Residential Settings*

In residential settings, it is the youngest children who have the highest risks for injury events. This is not only due to the stage of their physical and psychological development, but also because they have a higher degree of residential risk exposure, spending as they do more time at home (Ferrante et al., 2014; He et al., 2014; Sengolage et al. 2010; Towner & Mytton, 2009). And even if adolescence also is a period of precipitous changes, and not only physical and psychological, but also sociocultural and cognitive (DiClemente, Hansen, & Ponton, 1996), adolescents have not received the same amount of attention in research and policy as children and elderly. In addition, research on gender as a risk factor for injuries in residential settings indicates that males overall have a higher probability of injuries, and of more serious injuries, compared to females (e.g., Towner & Mytton, 2009). However, when the residential-area events are dived into indoors and outdoors events, females have a greater probability for indoor events than males (He et al., 2014). This seems understandable due to the covariance between gender, age, and extrinsic risk factors related to activities. Females and males often engage in different kinds of activities both indoors and outdoors. These activities are also often impulsive, and they depend on peer dynamics and time aspects (cf. Felson & Eckert, 2018:197ff.; Towner & Mytton, 2009).

Another risk factor for injuries is the presence of impairment or disabilities (Balazs et al., 2014; Chou et al., 2014; Petridou et al., 2003; Rowe et al., 2004; Sherrard et al., 2002; Yung et al., 2014). Physical disabilities, a risk factor especially for fall injuries, are explainable by the correlation between physical design and the degree of facilitated mobility, meaning that it is not the disability per se that is the risk factor, but rather the design (Petridou et al., 2003; Yung et al., 2014). Also cognitive disabilities, mainly intellectual disabilities (ID), constitute a risk factor in comorbidity with epilepsy and behavioural, emotional, or communicative difficulties, but not in itself when age and gender are controlled for (Sherrard et al., 2002).

In previous research, psychiatric disabilities, especially externalized neuropsychiatric disabilities have been taken to constitute obvious risk factors for injuries. Attention deficit

hyperactivity disorder (ADHD), for example, has been seen as a risk for both unintentional and intentional injuries, due to the characteristic behavioural symptoms of ADHD (Balazs et al., 2014; Chou et al. 2014; Keyes et al., 2014). On the other hand, what is often forgotten is that ADHD is also related to motoric problems (which are not affected by the common medical treatments used for those with the disorder), with individuals with ADHD overrepresented in fracture statistics (van den Ban et al., 2014; Lange et al., 2014). Also autism spectrum disorder (ASD) and opposite defiant disorder (ODD), which can have similar external symptoms, are likely risk factors, especially in combination with ADHD (cf. Cavalary & Romansky, 2012; Rowe et al., 2004; Schwebel et al., 2006). Noticeable here is, furthermore, that the injury patterns of individuals with disabilities and impairments lack the kind of seasonality that can be observed in injury patterns for people with no disability, indicating that persons with disability have different activity patterns (Petridou et al., 2003).

Residential areas, our built domestic environment, have not been adequately researched as sites of adolescents' unintentional injury events, with the exception of adolescents with physical disabilities. This absence of interest in environmental factors is in fact quite remarkable, since, as Cordvil and collaborators (2015) have pointed out, our built physical environment is designed for adults. With adults as the reference, some risk situations, moreover, become easily overlooked, as both the action and activity patterns are quite different for adults and adolescents. In addition, the home environment and a low material standard of the dwelling (connected to economic deprivation) have been shown to be a risk for fatal injury events (Sengolege et al., 2013). This connection between the dwelling and structural factors such as, in the first place, socioeconomic status (SES) and the degree of social integration seems also to play a role in the incidence of both intentional and unintentional injuries (Engström et al. 2004; Hjern et al., 2001; Reimer & Laflamme, 2005).

### *Injury Situations at School*

The Swedish school system includes both compulsory and non-compulsory schooling, with the majority of the adolescents opting to enrol also in the non-compulsory segments (Svensson, 2003:216). As research has shown, between 7 and 20 per cent of pupils in the country have been subjected to some form of violence in the school environment, and that 25 per cent have witnessed violence at school (Svensson, 2003:229). The incidents involved have been mainly about non-serious violence not requiring medical care (The Swedish National Council for Crime Prevention, 2001). Nonetheless, certain injury situations can escalate and quickly become more serious in nature. A national survey among ninth graders found a clear relationship between bullying and other forms of victimization for both males and females at school, including physical abuse and sexual victimization (The Swedish National Council for Crime Prevention, 2016:27–32).

A variety of social measures have been implemented in Swedish schools to reduce and prevent bullying and abuse. One of these was the Olweus programme, although if its effects are hard to measure due to lack of reliable evaluation forms. In any case, from October 2015 on one could detect a stronger emphasis being put in school safety and security discussions on hindering lethal violence at school. This paradigm shift was due to the



deadliest school violence incident thus far in Sweden, which took place on 22 October 2015. The change in the tone of discussions, indeed a paradigm shift, also resulted in an increased reliance on technical security measures to reduce or prevent school violence. Such technical solutions, however, have been shown by research to at least potentially and in the long run have a direct negative effect on the school atmosphere (Addington, 2009; Kupchik et al., 2015).

In addition, as studies have suggested, there is also a need to recognize the role place plays in the occurrence deviant events at school and the way place as such can affect the course of events. Schools are complex settings, combining a highly structured social organization and pedagogical aims and acting as one of the few arenas where adolescents meet one another regardless of their social status. Accordingly, more attention should be paid to the relationship between spatial and structural organization in schools (cf. Astor et al., 1999; Benbenishty & Astor, 2008; Mulvey & Cauffman, 2001).

### *Risk Factors in Suicidal Situations*

Previous research on suicides and suicidal risk factors is extensive and dominated by psychiatric and biological research on internal risk factors (e.g., Franklin et al., 2017; Skegg, 2005). Risk factors for intrapersonal injury include gender, other females inflicting self-injury/other males committing suicides,<sup>15</sup> low SES, low level of education, negative life events, family adversity, psychiatric factors, and factors related to identity construction (Adler & Adler, 2007; Agerbo et al., 2007; Bernburg et al., 2009; Hawton et al., 2012; Hodgson, 2004).

Given the scope of this dissertation, this section will highlight two additional circumstances, involving the difference between self-injury and suicide and the necessary presence of certain external elements for the suicidal act to take place. As Favazza (1998) has suggested, self-injury and suicides can be differentiated from each other by distinguishing between ‘feeling better’ and ‘stopping feeling completely’ (self-harm or self-injury as a way to feel better through the displacement of psychological pain by physical one; suicides as a way to stop feeling altogether). Self-injury here refers to a variety of behaviours, of differing severity, and it is usually committed during situational difficulties where a candidate solution is needed (cf. Redley, 2003; Skegg, 2005); to be sure, self-injury events can sometimes be lethal. Suicides, on the other hand, rely on a suicidal ideation instead of desire for pain alleviation as a motive force (Hawton et al., 2012). In addition, even where it is internal factors that trigger the intrapersonal injury, the act itself is dependent on external factors for its realization, mainly in terms of access to a lethal product or place (Clarke & Lester, 1989; Lester, 2009). Indeed, an increase in suicides frequently correlates with an increase in lethal methods in society (Clarke & Lester, 1989; Hawton et al., 1996; Oliver & Hetzel, 1972, 1973; Robinson et al., 2000; Whitlock, 1975; Yamasawa et al., 1980). Such possibility of the additional influence of external factors on suicide occurrence also implies that modification of physical environment may be an effective prevention strategy against suicides in general. This

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<sup>15</sup> The difference here between females and males can, to be sure, be due not to gender but to differences in methods: males tend to choose more lethal methods in suicidal events.

assumption has, moreover, been tested and confirmed in previous studies (Lester, 1993; O’Caroll et al., 1994; Reische & Michells, 2005), a path that I will continue on in this dissertation.

## 4.2 Literature Review II: Prevention

In this section, I first discuss the notion of injury prevention as employed in this dissertation, after which I provide a brief summary of the institutional context of that notion in Sweden, involving national laws and policies.

### *Defining Prevention*

In the second half of the twentieth century, the conditions of risk in our risk society began to produce a growing awareness of the importance of injury prevention (Green, 1997:95). Soon enough injury prevention was seen as operating on three different levels, each targeting different societal actors. There was the primary level of universal prevention, aimed at the population as a whole, the secondary level aimed at specific risk groups, and the tertiary level aimed at certain individuals at risk, or selective prevention (Green, 1997:104). This differentiation within prevention work was not explicitly meant to apply to injury prevention, however; its purpose was to inform prevention theory across disciplines such as social work, traffic medicine, and criminology (e.g., Green, 1997; Haddon, 1980; Lab, 2004:51ff.; Lund & Aarø, 2004; Sahlin, 2000) while it could also be divided into different paradigms (Table 5).

Table 5. Prevention matrix.

	<b>Social paradigm</b>	<b>Situational paradigm</b>
<b>Primary level</b>	General campaigns and community interventions to raise awareness  Legislation  Regulations  Policies	Product modification  General modification of the physical environment/urban planning, e.g., crime prevention through environmental design (CPTED)
<b>Secondary level</b>	Behaviour or attitude modification targeting certain risk groups and/or individuals at risk	Hotspot/directed place modification
<b>Tertiary level</b>	Individual social intervention and treatment	Personalized measures that minimize the number of occasions

The main difference here can be understood as consisting in the distinction between why and how unwanted events occur, and how they can be prevented. In general, prevention strategies targeting social factors rely on education and enforcement, while those targeting situational factors draw upon engineering, planning, and design.

The social paradigm also depends on certain preconditions that only seldom are as straightforward as one might assume. The main criticism against social countermeasures overall, for instance, has been that individuals do not respond to interventions the same way. For example, strategies based on information dissemination are developed based on the assumption that more knowledge changes cognition, which in turn brings a change in attitudes affecting, subsequently, also practice (for more on this so-called CAP model, see Lund & Aarø, 2004). However, as criminological research has shown, the relation can be rather the opposite, with ‘practice’ being followed by ‘attitude’ through rationalization or neutralization (Sykes & Matza, 1959). Moreover, individuals tend to pick and choose ‘credible’ information based on their own individually held values, and are therefore not susceptible to information that does not readily confirm or fall in line with their personal convictions (Festinger, 1957; Sol Hart, 2013).

Also the more selective prevention strategies related to skill or behaviour training appear to be problematic, since there are indications that, instead of reducing risky behaviours, interventions based on them may in fact increase such behaviours (e.g., Deci, 1971; Sol Hart, 2013). The same way, also the situational paradigm has been criticized, although mainly for working with symptoms instead of causes and for resulting in ‘learned helplessness’ at the level of the individuals. Given this complexity, many researchers today have gone on to suggest a combination of intervention measures, or applying community-based interventions such as safety promotion (e.g., Laflamme et al, 1999:119ff.; Lund & Aarø, 2004; Welanders, Svanström & Ekman 2004).

Against this context, a ‘pure’ environmental perspective in situational injury prevention, implying the necessity to view injuries and injury situations from an environmental perspective, suggests itself as a promising path to pursue (see, e.g., Clarke & Lester, 1989; Haddon, 1972, 1980; Lester, 1993, 2009; Mair & Mair, 2003; O’Carroll et al., 1994; Reische & Michels, 2005; Smith, 1996; Torell & Bremberg, 1998; Ulrich, Bogren & Lundin, 2012; Wegman et al., 2002). However, for it to be successful in terms of the interventions based on it, there is a need to first understand the complex web of relationships and interactions resulting in injury events. For this reason, the environmental perspective needs to have the capability to co-ordinate under it different kinds of efforts and multifaceted approaches that can be put to use at the same time. In a word, prevention design and implementation must both be carried out with a full understanding of the environment’s complexity (Peek-Asa & Zwerling, 2003:87).

#### *A Note on Policies and Laws*

In Sweden, a systematic approach to child safety was developed during the mid-1950s.<sup>16</sup> In 1955, the parliament adopted a resolution on state aid for preventive work, although the subsequent investigation related to the proposed legislation was finally left without any funding (National Child Environment Council & Folksam, 1989:20).

Parallel to the political discussions, a co-operation committee was set up involving private actors, non-governmental organizations, and insurance companies, aiming to highlight the

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<sup>16</sup> The term ‘child’ here is used in its juridical sense, referring to all individuals aged under 18.

child perspective in housing and traffic planning. As one result, in 1973 the Swedish National Planning Agency issued standards for housing design and residential interior furnishings, to prevent unintentional injury events involving children (Gustafsson, 2010; National Child Environment Council & Folksam, 1989: 36, 47).

At the same time, the political work on the question continued, leading to two government investigations (Ministry of Health and Social Affairs, 1979, 2003). The later of these investigations highlighted the relationship between the physical environment and injury events, stressing the importance of developing an active approach to injury prevention, working with knowledge-based decisions, implementing prevention measures in the housing stock, and establishing clear roles and responsibility for safety work and prevention. Despite these recommendations, there is still today no aggregate legislation to regulate child safety in the built environment, with the responsibility for it divided among several actors, each with their respective legislation. According to the National Board of Housing, Building and Planning (2011), a total of nine different laws regulate safety in the built environment, divided in indoors and outdoors areas.<sup>17</sup> Even though child safety as an issue has thus become greatly detailed, there is thus no single entity or stakeholder with the ultimate responsibility for investigating and ensuring it.

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<sup>17</sup> PBL (2010:900), BBR (BFS 2011:6), OL (1993:1 617), PSL (2004:451), AML (1977:1160), ELSÄK-FS (2008:1), SS-EN 1176, SS-EN 1177, and MB (SFS 1998:808).

## 5. INJURY EVENTS AND THE LAYOUT OF PLACES

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In this section an extended discussion of the first feedback mechanism between the two processes is presented, with a focus on different injury events and the construction of a mechanistic explanation for them centred on candidate properties (e.g., environmental ‘primitives’ relating to action<sup>18</sup>) and features (e.g., features of the design or design configuration) influencing the events. The results presented in this connection prompt theoretical reflection and comparison between the separate sub-studies and papers included in this dissertation.

### 5.1 Injuries Situated in Residential Settings

The first sub-study in this research sought to identify different cumulative factors and mechanisms related to injuries occurring at different levels (micro, meso, macro) and in varying relationship to the human–object context. In what follows, first the human–object relationship is presented via an in-depth analysis of disability as a risk factor. After that, the triadic human–object–context relationship is examined, through a study of fall injuries as a convergence between individual and structural predispositions and built environment. Finally, the object–context relationship is explored in a study of injuries in residential institutions. Due to the broad array of risk factors identified by previous research (see Chapter 4), the research conducted for this dissertation opted for a more limited set of risk factors, focusing on situational elements as predictors. These predictors are later related to causes or mechanisms, instead of merely correlations, to enable the development of prevention strategies (Chapter 6).

#### *Disability as a Risk Factor: The Human–Object Interrelationship*

The presentation here summarizes the findings from two papers and one report, published as part of the ArchSafe project and focusing on disability, injuries, and risky situations.<sup>19</sup> In combining and re-interpreting the results from registry data analysis, document analysis, and research circles, the results can be summarized better and discussed more thoroughly with a focus on adolescents’ injury locations, injury situations, and risk management.

As Table 6 below shows, there was a difference between injury locations for children and adolescents with and without physical disability. The main difference was the distinction between indoor and outdoor frequency of injury events. Those with no disability in the age group had a frequency of a total of 37.5 per cent of outdoors injury events, compared to those with disability (14.3% of the injuries occurring outdoors). The difference was approximately 23 per cent, indicating that adolescents with and without disability may have different routine activities and therefore a different risk exposure in their environment. This difference in routine activities was also noted by Petridou and collaborators (2003) in terms of temporality and seasonal variation between the two groups. Tentatively, this pattern might be explained as a factor of adolescents with no disability spending more time

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<sup>18</sup> In criminology, these properties are often termed as criminogenic or criminocclusive (Ekblom & Sidebottom, 2007; Felson, 1986) and related to other properties such as offenders and/or guardians, to create a behavioural setting.

<sup>19</sup> See Thodelius, Ekbrand et al. (2017); Thodelius & Lundälv (2018); Thodelius, Lundälv, Göteborgsavdelningen DHR et al. (2016).

outdoors compared to their peers with disability, putting themselves therefore at an increased risk for injuries (e.g., because the outdoor areas in residential settings are poorly adapted for adolescents with disability). The same has also been found by others working in the field (Barnard et al., 2010; Petridou et al., 2003; UNICEF, 2013).

Table 6. Location of the injury event for people aged 0 to 19, Skaraborg County, 2001–2015 (n=15,640), based on (outpatient) injury-related emergency room visits (modified from Thodelius, Ekbrand et al., 2017).\*

Location	Age and ability (%)	
	0–19 yrs., no disability	0–19 yrs., with disability
Bedroom, hall, dining room, living room	43.4	24.2
Yard, including tool house, swimming pool	22.8	3.3
Private driveway, parking lot, carport, footpath, courtyard	9.6	2.2
Kitchen	9.8	8.8
Residential outdoors areas including balcony, stairs, roof, terrace	5.1	8.8
Residential institutions	0.4	1.1
Stairs (indoor), including landings	5.2	50.5
Bathroom, including WC, shower, sauna, laundry	3.6	1.1
<b>Total</b>	<b>100</b>	<b>100</b>

\*Locations in the table are given in the IDB registry and were not constructed in the ArchSafe project.

In the qualitative analysis of the materials from the research circle, a spatial pattern emerged that pointed out to the kitchen and the bathroom as risky indoor locations, along with the apartment block entrance and stairways as risky common areas. While, according to the quantitative analysis in this research, the kitchen and the bathroom were low-probability injury areas for adolescences, the probability for injuries in these locations increased with age (Thodelius, Ekbrand et al. 2017). As the research circles included participants from all age groups, these locations were mentioned several times. Nevertheless, they were also of symbolic importance for independent living, demonstrating one's ability to attend to one's hygiene in the privacy of one's home and cook one's meals, and so caused in some cases worries and stress about injury risks. Moreover, both younger and older participants agreed that semi-public areas represented a risky location. In the semi-public or shared spaces, such as building entrances and stairways, the injury risk was more connected to the feeling of uncertainty in situations. Bad lighting, poor building maintenance, lack of visual cues and contrasts, and uneven surfaces were elements contributing to such sense of uncertainty and creating risks for individuals, as observed also in previous research (e.g., Bueno-Cavanillas et al., 2000; Masud & Morris, 2000; Nitz et al., 2012).

Research circle participants furthermore highlighted the importance of risk-management or applied risk-avoidance strategies in everyday life. These strategies represented a way to handle challenges in residential areas. Three different strategies to manage risks could be discerned: use of equipment/disability aids, normalization, and avoidance of situations (Thodelius et al., 2016). Of these, the use of equipment and disability aids was, however, not as unproblematic as it might seem at first glance, for several reasons. Some issues brought up in this connection were the high degree of standardization in the equipment sold, poor instructions, and lack of training in the use of the equipment. People were often given only one aid product in a standardized form, which then might not have fit in their current dwelling situation or not allowed any individual adjustments to it. The instructions were often poor, and there were few opportunities available to learn the use of the aid product under guidance, since rehabilitation centres typically allowed no more than only one or two appointments for information and consultation. This could then in fact only contribute to increased risks, instead of decreasing risks, as the individuals used their aids products wrongly. Normalization, for its part, was most often a strategy followed by the youngest research circle participants. ‘It’s always been like this’ was a typical comment indicative of it, while some also feared losing their apartment if they presented any demands. It seemed to be easier to simply adjust oneself or one’s interests rather than adapt one’s home for these. Finally, avoidance of places or activities was often connected to normalization, resulting in isolation and/or reduced social time, or in what one participant described when telling that ‘I stopped visiting my friend since her building didn’t have an elevator’.

A third aspect of the human–object relationships that needs to be addressed in relation to disability as a risk factor is the judicial framework for home adaptations. The latter can be seen as passive interventions aiming to modify inaccessible environments in order to decrease risks in everyday life, thereby enhancing social participation and possibilities for independent living. In Sweden, the legislation concerning home adaptations is well developed, but there seem to be frequent problems with the way the law is interpreted at the municipal level, especially in terms of gender, costs, and the concrete adaptations to be made (The Swedish Agency for Participation, 2016). To examine whether (and in which ways) the law might be interpreted differently in different municipalities, a study of appealed court decisions concerning residential adaptations in Western Sweden was thus conducted. Overall, the general pattern was that applications for indoor adaptations were more common among house owners while applications for adaptations for a shared space predominated in the case of apartment blocks (Table 7).

In contrast to previous studies (e.g., Svensson, 2013), the analysis here did not reveal any gender differences in court decisions for or against; instead, the dwelling situation appeared to have significance. Approximately two thirds (66.1%) of the appealed cases were rejected, mainly due to economic reasons, in the case of detached houses (e.g., adaptations would not increase the value of the property), while in the case of apartments the view was most often that it was the landlord or property owner who had the responsibility for resolving any issues concerning shared spaces. Moreover, in several cases the court suggested that the appellant divide her or his space differently to make the living

environment more accessible and safe (e.g., by beginning to sleep in the living room to avoid having to take stairs to the bedroom, or re-allocate hygiene routines to the kitchen).

Table 7. Appealed district court decisions, 2010–2016, Appellate Court of Western Sweden, in percentage points (n=53) (from Thodelius & Lundälv 2018).

<b>Location</b>	<b>All cases</b>	<b>Apartment blocks</b>	<b>Detached houses</b>
Annex	9.4	4.0	14.3
Bathroom	18.9	16.0	21.4
Doors	3.8	4.0	3.6
Entrance	17.0	36.0	-
Flooring	3.8	4.0	3.6
Kitchen	7.5	4.0	10.7
Other	9.4	4.0	14.3
Stairway	17.0	16.0	17.9
Terrace/Garden	7.5	-	14.3
Utility room	5.7	12.0	-
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>

*Note:* The analysis was conducted at a general level (appeals of court decisions overall) and it was not specific for cases involving adolescents.

Such rationales behind home adaptation application rejections can be described as incidents of a ‘repudiation of responsibilities’, since, through them, the court system effectively re-directed responsibility to other actors. The consequences of this in the case of apartment blocks could be especially tangible, since the landlords and property owners could then refer to other laws with different regulations and expectations regarding accessibility.<sup>20</sup> The result could then be that the apartments themselves could be functional and accessible, but not the shared spaces and common areas, which then continued to hinder the occupants in them from living an independent life.

In conclusion, the three studies show the shared spaces to be a risky location for disabled adolescences, and the risk involved to be construed both objectively and subjectively. The first study identified the injury pattern related these areas, in the research circles shared spaces were described using the emotional terms of insecurity and fear, while, finally, the discussion to vagueness in the judicial sphere when it came to pursuing one’s need to have support for home adaptations.

### *The (Lack of) Influence of the Built Environment on Fall Injuries*

In this section, the human–object–context relationship is discussed in relation to fall injuries. The analysis in this research was conducted on data from IDB, PAR, and Statistic Sweden. Three age groups with highest probability to be injured in a fall injury event were defined: children aged 1 to 2, adolescents aged 12 to 14, and elderly people aged 80 or over.<sup>21</sup>

<sup>20</sup> See, e.g., <http://www.t-d.se/sv/TD2/TIBB/Befintligt-bostadsbestand/Lagar-och-regler/Bygglagstiftningen--krav-pa-bostader--sammanfattning/> (accessed 3 May 2018).

<sup>21</sup> See Ekbrand et al. (2018).



The common risk factors for fall injuries for all the three groups included: outdoor temperature, being born outside of Sweden in another Nordic country, and gender. These factors represented the only significant finding for the age group 12 to 14 years old in the analysis. Socioeconomic factors, type of residence, size of residence, and the year of construction did not affect the probability for fall injuries for his group. In addition, the predictors related to ethnicity and gender for adolescents were not so strong, compared to the youngest (aged 1 to 2) and the oldest (aged 80 or over) age group, which also had predictors on the contextual and individual level and related to the built environment. More remarkable, however, was that the analysis yielded no significant results for any of the three groups when it came to household income, indicating that income per se might not affect the probability for fall injuries. The analysis, furthermore, in contrast to findings from previous research, showed higher average household income in the area to increase the risk for the youngest and the oldest age groups, contradicting the hypothesis that low SES in it might explain any disparities found in injuries (cf. Sengolege et al., 2010; Willson, 2009).

The above results indicating adolescences' lack of risk factors, combined with the lack of significant results for any of the three groups on household income, might indicate two things: a contextual effect of the Swedish welfare system and the circumstance that risk-taking amongst adolescents is in general unaffected by socio-economic background (cf. Felson & Eckert, 2018:191ff.). In comparison, gender seemed a more important factor in risk-taking likelihood, given that boys and young men (or men in general) overall are more likely to have fall injury events, compared to women. As noted by Laurendeau (2008) regarding voluntary risk-taking, or edgework activities, males tend to engage in them and other comparable activities under the influence of hegemonic masculinity. Gender and gendered risk-taking are, so to speak, part of the socio-cultural practice in everyday life, but also part of the routine activities of males more specifically, with those routines being both collectively and individually predisposing at the same time.

### *Context and Object: Residential Institutions as Injury Locations*

This section discusses the context–object interrelationship with a focus on residential institutions. While the interpretations presented are based on a co-authored paper analysing institutions in general (Thodelius, Andersson et al., 2017), the perspective of adolescence is in the forefront.

This study was inspired of Goffman (1991), proceeding also from his definition of institutions as social hybrids (Goffman, 1991:5). Such hybrids, combining both residence and work, are organized along individuals' social roles and their symbolic rituals. Furthermore, institutions also are capsuled spaces, bounded locations where individuals are brought together for a specific purpose. Residence in these institutions, whether voluntary or involuntary, means that one takes part in processes of institutionalization, with each day at the institution sequenced into different phases resulting in formal administration of life (Goffman, 1991:4ff., 94, 189). In contrast to Goffman's categorization of the five institutions (1991:5, 118), however, this study uses a slightly different typology to better reflect the particularities of the Swedish context.

First of all, the residential institutions included in the research for this dissertation only included three distinct kinds of them: residential institutions that take care of individuals who are incapable, residential institutions that take care of individuals at risk, and residential institutions that protect society against intentional danger. The first named of these included hospitals, nursing homes, and facilities operating under the Swedish Act concerning Support and Service for Persons with Certain Functional Impairments (SFS 1993:387). The aim of this act (LSS) is to ensure that people with severe and permanent disabilities have good living conditions. Institutions taking care of those who are at risk include accommodations and facilities operating under the country's Care of Young Persons (Special Provisions) Act (LVU; SFS 1990:52), Care of Substance Abusers (Special Provisions) Act (LVM; SFS 1988:870), and Compulsory Mental Care Act (LPT; SFS 1991:1128). The last-mentioned of the institutions in this study, those that incapacitate individuals posing a danger to society, included prisons (regulated under the Swedish Penal Code, BrB; SFS 1962:700) and residential institutions operating under the country's Secure Youth Care Act (LSU; SFS 1998:603).

Secondly, the degree to which these institutions were 'total' varied. LSS facilities, for instance, are significantly less total in their character than prisons or residential LSU institutions, which may then affect the incidence of injuries in them. Thirdly, the institutions also differed from one another in terms of how long individuals tended to stay in them, thus coming with differing degrees of flow of individuals in and out of them, which in turn impacted injury risks in them. Hospitals, for example, have many patients staying for a short period only, unlike, say, prisons in which multiple inmates are staying for a longer duration. Despite such differences between the residential institutions, it is instructive to compare them to highlight their diversities and resemblances so as to be able to elucidate the complexity between object and context.

In the analysis, adolescents were a risk group in two types of residential institutions: the institutions for adolescents at risk (LVU, LVM, and LPT accommodations) and institutions aimed to protect the society from intentional danger, such as prisons and residential LSU homes. However, the risk groups and injury patterns were different in these two cases. In institutions for adolescents at risk, females aged between 17 and 22 were the ones injured most frequently, and in the danger-to-society institutions, it was males aged 19 or over who were most often injured.<sup>22</sup> Furthermore, also the injury patterns differed, with females more often having intentional injuries and males more often a mixed injury pattern. These differences can be explained drawing upon three intertwined perspectives: one focusing on the aim and social organization of the institutions, one on the degree of freedom in the spatial setting, and one on structured time.

LVU, LVM, and LPT accommodations all have a rehabilitation and treatment rationale, and they come with a supporting social organization and surveillance staff. Nevertheless, the person's degree of freedom in their spatial settings appears to be higher than in prisons and comparable accommodations. In addition, the individuals residing in them have a

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<sup>22</sup> This result, however, can also be due to the geographical distribution in the dataset, since it did not include any areas with women's prisons.

greater amount of unstructured time available to them, creating opportunities for intentional injuries (e.g., through the use of hidden razors, medication, or other opportunities for self-injury).

The second institutional type, prisons and residential LSU homes, is in general characterized by a higher degree of what Goffman (1991:5) has labelled as the formal administration of everyday life. In these institutions, everyday life is sequenced into different phases like breakfast, work, lunch, work, spare time, and night-time, not only structuring the time but also limiting the resident's freedom in the spatial setting. This might then explain the injury pattern found for them in this study, one that was more similar to 'life on the outside', indicating that life on the inside is a copy of everyday routines where different activities and situations keep succeeding one another.

As concerns these two types of residential institutions more in general, their spatial settings need to allow a balance to form between formal control, informal control, and privacy, so as to actively support conformist behaviour in the interest of reduced injuries. However, compared to the third type of institution, those that take care of individuals, for example, in an LSS setup, it is hard to find any specific spatial elements in them that would influence injury occurrence. Instead, the analysis shows that the spatial organization needs to be suitable for the social organization, and vice versa. Thus, the professional practices are embedded in the physical and social environment, supporting each other.

#### *Linking Predictors to Causal Mechanisms in Adolescents' Injury Events*

Before concluding this description of the findings from my dissertation research on residential settings and defining the elements and mechanisms with relevance for the formulation of preventive strategies, the overall results need to be summarized. As seen from Table 8, the situational elements discovered can be structured, related to the different analytical units, and interpreted in relation to the theoretical assumptions of RAT and SAT.

Table 8. Linking situational elements, analytical units, and theoretical assumptions in residential injury situations.

<b>Research units</b>				
	Context	Setting	Situated activity	Self
<b>Situational elements</b>	<i>Conditioning risk exposure:</i> Outdoor temperature, temporal absence of guardians, ideological preconditions.	<i>Risk objects in residential areas:</i> Capsuled space. Containment spaces indoors, shared spaces outdoors.	<i>Risk activities:</i> Actions related to everyday-activity, such as mobility or finding opportunity for violent encounters or self-harm.	<i>Habitus:</i> Age, gender, born outside Sweden in another Nordic country, presence of disability.

An injury event, as interpreted through SAT, is in fact related to two different inputs or causes (individual and environment), with the interaction between these results in a causal process (mechanism) resulting in an output or an effect (i.e., an injury or a non-injury event). As Wikström (2012:62–63) has noted, the situational mechanism behind action is always dependent on the perception–choice process, which is initiated and guided by the person–setting interaction.

As seen from the above analysis of injuries in a residential situation, individuals' predisposition (the dispositions of their habitus) for injury situations depends on their age, gender, ethnicity, and presence of disability. Thus, these traits can be said to relate to and condition not only different lifestyles, but also different use of place in general, either as behaviour, routines, or action. Also the ability to perform different routines and actions needs to be recognized, however, since both intention and the ability to realize one's intentions are equally important.

The environmental inducements for injury situations to arise are in general related to different risk exposures due to changes in routines, temporal absence of guardians, or ideological preconditions bi-directionally affecting and being affected by the settings and the habitus. However, even if the containment space showed no specific effect connected to the built environment in this study, the shared spaces seemed to be of importance, suggesting some similarities to the capsuled space in that they are both hybrid-used (e.g., candidate properties).

In light of the results of these analyses, the discussion of the preventive measures in the next chapter (6.1) will be limited to shared spaces in dwellings and residential institutions with the highest apparent prevention potential using IPTED. More specifically, these risky locations of adolescents include the following: entrances, stairways and the outdoor areas in the vicinity of dwelling units, the private room, corridors, backyards, as well as entrances into residential institutions (e.g., design features).

## 5.2 Violent Situations in School Settings

The study of violent situations in school settings for this dissertation is presented here in an extended context, including not only injury risk situations, but also risk situations more in general as well as incidents of lethal violence.<sup>23</sup> First, risky situations, everyday violence, and lethal violence are discussed, after which the spatial organization of violence is defined, before, finally, addressing some paradoxes related to today's applied definitions of threat and risk as related to schools.

### *Risky Situations, Everyday Violence, Lethal Violence*

Before discussing risky and violent situations at school, the conditions characterizing school settings more in general need to be outlined, since these conditions also affect student interaction. School is one of the sites where adolescents spend an extensive amount of time in their everyday life. In Sweden, the school system comprises both compulsory and non-compulsory school, with the majority of the country's children and youth also

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<sup>23</sup> This section is based on Thodelius & Sandén (2017) and Thodelius (2018).

attending the non-compulsory school. More in general, schools are quite unique settings, being one of the few settings where adolescents come together regardless of social status, while also providing an important setting where secondary socialization and the development of adulthood to a significant extent take place (Gottfredson, 2001:1; Hirschi, 1969; Viner et al., 2012). In other words, schools are a complex setting, and not only because they need to have the capability to integrate different needs from students with pedagogical challenges; they also need to incorporate requests from parents, politicians, and other societal actors, and, last but not least, provide safe and secure settings for our children and their everyday. A school may therefore be defined as an institution that is of importance not only to individual citizens, but also to the society itself. At the same time, however, schools are also caught in a constant change, due to the societal context, owing to which there are always trade-offs for them when attempting to reduce their complexity: more focus on good grades and physical security, for instance, might imply less focus on a positive psychological environment and comfort/safety, and so on.

Most of the previous research on risks and interventions within the school setting has concerned either social interventions or ways to facilitate technical perimeter protection; only few studies have addressed themselves to school design as an actant in risky situations (exceptions include Astor et. al, 1999; Felson, 1986; Fennelly & Perry, 2014; Flathery, 2000; Helbing et al., 2005). For this dissertation, three different risky situations were therefore related to injury risk: assaults, bullying, and lethal violence. Below, these are analysed in relation to socio-spatial practice and the aspect of spatial organization in school designs. In doing so, the focus will be on situations occurring indoors during school hours, even though both the outdoor areas and the fact that schools are used for different purposes and activities ought also to be addressed; due to lack of space and the scope of this dissertation, however, this is something that will be left for future projects.

Although assaults and bullying are likely quite common as phenomena of deviance in school settings, events involving them often go unreported and the frequency with which they occur is therefore difficult to estimate. Moreover, bullying has not been given any universally applicable definition, and it is difficult to distinguish between mean jokes, teasing, and bullying (cf. Farrington, 1993:384), which makes it hard to react to and act on incidents. The definition of bullying as used in this dissertation characterizes it as a form of symbolic violence (cf. Bourdieu & Wacquant, 1992:168).

Also minor violent situations and assaults seem to often go unreported in Swedish schools. One estimation, however, is that between 7 and 20 per cent of the students in them have become victimized by these forms of violence at least once, and that 25 per cent have witnessed violence taking place (Svensson, 2003:229). The figures have been confirmed in subsequent self-reports, thus making a good case for considering schools as the most likely site in today's Sweden for assaults and sexual offences to occur among the country's youths (The Swedish National Council for Crime Prevention, 2016:28, 30).

In contrast to the other two forms of risky situations, the occurrence of lethal violence in schools is rare, not only in Sweden but also internationally (for more details, see Böckler et al., 2013:9ff.). It is, furthermore, important to note that lethal violence in Swedish schools

tends to show a different crime structure (modus operandi, place of occurrence, degree of planning) compared to the more (in)famous cases elsewhere. In any case, lethal violence in Swedish schools, too, is often discussed in terms of school shootings, even though Sweden has only had two shootings taking place in school settings in the last 60 years.<sup>24</sup>

In line with Thodelius and Sandén (2017), the six cases of lethal violence to have hitherto taken place in Swedish schools can, as a whole, be characterized as having come about as a result of escalating conflicts motivated by an interpersonal revenge and including one targeted victim killed with a knife or a similar stabbing weapon. Table 9 shows the different forms of revenge documented thus far in Swedish schools.

Table 9. Typology of lethal violence in Scandinavia (based on Thodelius & Sandén, 2017).

	<b>Perpetrator has a relation to school</b>	<b>Perpetrator has no relation to school</b>
<b>Single victim</b>	Type I: Interpersonal revenge	
<b>Multiple victims</b>	Type II: Institutional revenge	Type III: Societal revenge

As can be seen, the type of revenge appears to depend on two factors: the perpetrator's relation/lack of relation to the school in question and the number of would-be victims. All the Swedish cases thus far can be defined as being of Type I, thus differing from international cases, which have mainly involved Type II events definable as random violence with students targeting staff and fellow students in their own school in a frenzy, with gunfire as an institutional revenge (for a more detailed discussion of this type, see Lindgren & Thodelius, 2017).

### *Spatial Organization of Violence*

To understand the importance of place in risky situations in the school context, the specific spatial patterns need to be considered in relation to perceived space and socio-spatial practice (cf. Lefebvre, 1991:38). The perceived space in school settings has the specific characteristic of spatial sets or spatial organization of functions, such as classrooms, hallways, or student lounges, which also organize routine school activities such as going to class, having breaks, and so on. This organization then affects the use of place. That place, however, is designed mainly for certain expected (anticipated) activities, which do not cover the full range of students' activities as they unfold in the course of a school day in response to their changing roles. Thus, also students' interactive states shift, in accordance with the different activities they engage themselves in. Interactive states, according to MacLaren (1999:85ff.), are different styles of interacting with one's environment that can be categorized as student state, street-corner state, sanctity state, and home state. At school, the student state and the street-corner state entwine. Schooling, as organized activity, is connected with the student state, while breaks and other unorganized activities cause pupils to switch to the street-corner state instead, which implies that risky situations are bi-directionally related to social and spatial organization of the routine activities (cf. Dovey & Fischer, 2014).

<sup>24</sup>In Kungälv (1961) and Bromma (2001).

This bi-directional relationship also helps us to understand why events and situations tend to cluster in schools, and why these clusters are not random but, instead, assembled connections, containing information on how territories, boundaries, and identities are constructed (Dovey & Fischer, 2014). It is, moreover, important to recognize the importance of pace changes during the school day for student states, along with the complexity and challenges in which this results. The school has more than one function (serving as the site for organized learning activities) that needs to be addressed in the design. As seen from Table 10, the hotspots of violence in schools tend to be related to the two dichotomies of visible/non-visible and private/public in their spatial organization of functions, affected not only by the social organization of the school day, but also the different interactive states at the level of individuals.

Table 10. Hotspots of violence in schools, with the most frequent places of occurrence indicated with a plus sign (based on Thodelius, 2018: Thodelius & Sandén, 2017).

	<b>Restrooms</b>	<b>Hallways</b>	<b>Student lounges</b>	<b>Locker rooms</b>	<b>Stairways</b>
<b>Bullying</b>	+	+		+	
<b>Assaults</b>		+	+		+
<b>Lethal violence</b>		+	+		

Bullying seems to be dependent on two things: the visibility of the victim, and non-visibility from adults or other capable guardians in the school setting. Not just the restrooms and the locker rooms, but also hallways facilitate non-visibility as more private areas, thus also facilitating anonymity. However, bullying can be seen as a form of instrumental offending, differing from ‘pure’ physically violent crimes definable as expressive offending. Accordingly, also the influence of spatiality differs between the two forms. Expressive offending such as abuse and lethal violence tends to occur in public areas and relate to provocation due to high social density or as escalated social-status war (cf. Cornish & Clarke, 2003; Klein, 2012:11ff.). Crowding, or high social density, is criminogenic, and public areas in schools tend to become bottlenecked during breaks (cf. Felson, 1986; Flathery, 2000) when also pupils’ interactive states tend to shift from student interaction to peer interaction or street-corner mood as a result (cf. MacLaren, 1999), altering the teleoaffective structures conditioning the situation (cf. Schatzki, 2005).

In general, there seems to be a connection between the kind of everyday violence and lethal violence occurring in Swedish schools, with lethal violence breaking out as a result of an escalating earlier conflict (cf. Collins, 2008, 2012). In addition, also the more unusual forms of lethal violence, such as institutional revenge (see Thodelius & Sandén, 2017), appear to be related to conflicts definable as social-status war. In schools, these are linked to different forms of capital, such as bodily, social, cultural, informational, economic, and symbolic capital (see Klein 2012:12; Newman et al. 2004:246ff.). All in all, schools are thus both conflict arenas and part of conflicts connected to social-status wars, in the first place since they are one of the few arenas where adolescents come together regardless of social status (Gottfredson, 2001).

It seems clear already based on the research for this dissertation that, in school settings, this kind of events and risky situations tend primarily to occur in ‘un-owned’ places. This is in line with, among others, Astor and colleagues’ (1999) study of school violence. Indeed, incidents taking place in ‘owned’ places such as classrooms or cantinas are very few. This is due, mainly, to two factors: the highly structured nature of the activity and the high degree of staff supervision or surveillance in such spaces. The structured nature of the activity becomes a sign of expectations and reduces the number of available social roles for the students (with the student interactive state predominating; cf. McLaren, 1999). Also surveillance promotes self-regulation, given that, as Kaplan and collaborators (1978) have pointed out, offending is often opportunistic in nature, with the opportunity for it arising as a result of target, risk, effort, and payoff.

### *The Paradox of Threats and Risk Management in School Settings*

When it concerns interpersonal-injury risks in school settings, the object–context relationship appears to be importance in the general discourse on how schools need to be secure instead of safe, even if the two terms are frequently used as synonyms in public debates. However, also the risky situations talked about are, in general, not defined properly, due to social amplification that causes extreme cases to attract more attention than more commonplace situations. The dominant approaches to prevention are, as a result, often based on political or public discourses instead of factual knowledge deriving from in-depth analysis. What this, in turn, results in, furthermore, is implementation of measures based on hypotheses concerning the offender instead of the causes, leaving the approach also generally ‘reactive’ instead of ‘proactive’. In contrast, a risk society point of view would look at the threats in schools as something connected to either individualistic traits such as mental problems of lone students or ‘unspecified offenders’ from outside, concentrating on the criminogenic interaction between humans and their environment in a specific context instead.

In the present study, risky indoors situations mainly involved would-be student offenders (e.g., internal threats). Moreover, opportunity appeared as something needing to be examined further when discussing the prevention of this kind of situations. Both instrumental and expressive offences at school appeared to have a close relationship to their physical setting, although in different ways. The instrumental offences revealed the direct influence of the physical design, unlike the expressive offences, which were only indirectly facilitated by it. Consequently, the physical design of the school settings needs to be analysed in relation to risky situations, to contribute to the development of relevant prevention strategies. Here two hotspots in particular are of interest, moreover: hallways and student lounges. These two types of locations are, in general, spatially not as fully integrated into the school setting as some other spaces such as the classroom and the cantina. They can therefore be understood as situational environmental inducements for interpersonal injury events. Proceeding from this understanding, instead of merely looking to analyse who those committing the acts are, it becomes possible to examine situational causes, which, from the point of view of preventive work, appear more relevant than individual risk factors, since risk factors are simply predictors and not causes per se (cf. Wikström, 2012:57).



### 5.3 Suicidal Situations

In this section, the main results obtained for suicidal situations are presented and related to the theory. First, the extent of suicides will be presented for the age group 13 to 19 years.<sup>25</sup> Next, the suicidal situations are categorized in a typology consisting of four different events. After that, the main characteristics of adolescents' suicidal situations will be examined, before, lastly, looking at the suicide methods as well as the spatial and temporal elements of those situations. The research conducted for this dissertation covered both completed suicides and suicide attempts, and it was geographically limited to the city of Gothenburg and its vicinity (including the municipalities/towns of Mölndal, Kungälv, Partille, Mölnlycke, Lerum, and Öckerö) in the statistical analysis and in the conducted interviews and observations. The online narratives, on the other hand, included also other Swedish and, in addition, also British and American cases.

#### *The Extent of Suicides and Suicidal Events*

The extent of suicides in the city of Gothenburg and its vicinity was statistical analysed for the years 1999–2013. During that period, a total of 56 adolescents committed suicide in the area, at the average rate of four suicides a year. Of these individuals, 22 were females and 34 were males. Accordingly, in approximately 34,5 per cent of all cases of death of adolescents in the area the cause was then suicide – a relatively high figure compared to the corresponding national average (which is 24 per cent).<sup>26</sup>

Table 11. Logistic regression, cause of death records, Gothenburg and its vicinity, 1990–2013, death by suicide for the age group 13–19 years ( $n_{\text{male}}=15,755$ , whereof 34 deaths due to suicide,  $n_{\text{female}}=14,435$ , whereof 22 deaths due to suicide). Log odds, standard error in parentheses.

	<b>Model 1(females)</b>	<b>Model 2 (males)</b>
Household income	2.53 <sup>e-7</sup> (4.196 <sup>e-07</sup> )	-1.413 <sup>e-08</sup> (6.413 <sup>e-07</sup> )
Average income in SAMS area	1.397 <sup>-7</sup> (4.196 <sup>e-07</sup> )	-1.786 <sup>e-06</sup> (1.577 <sup>e-06</sup> )
Age	3.638 <sup>e-01</sup> (1.525 <sup>e-01</sup> )*	3.903 <sup>e-01</sup> (1.277 <sup>e-01</sup> )*
Country of birth (Sweden, ref=1)	— <sup>1</sup>	— <sup>1</sup>
Mother's country of birth (Sweden, ref=1)	— <sup>1</sup>	— <sup>1</sup>
Father's country of birth (Sweden, ref=1)	— <sup>1</sup>	— <sup>1</sup>
Intercept	-2.592 <sup>e01</sup> (3.690 <sup>e03</sup> )	-2.637 <sup>e01</sup> (3.078 <sup>e03</sup> )

Significance level: \*=0.05, \*\*=0.01, \*\*\*=0.001. <sup>1</sup> No significant estimate was obtained, even though nine different country clusters were controlled for in the regression (Africa, Asia, EU28 excluding the Nordic countries, Europe excluding EU28 and the Nordic countries, North America, the Nordic countries excluding Sweden, Oceania, The countries of former Soviet Union, and Latin America).

<sup>25</sup> While in the statistical analysis 'adolescents' was defined as all those aged 13–19, for the qualitative work the category was expanded, including all those in the age group 12–24. This widening of the scope of data collection to include more cases enabled a better in-depth analysis of suicidal situations and the human–environment relationship in suicidal events.

<sup>26</sup> The percentages are calculated based on data obtained from Statistics Sweden. In Gothenburg, a total of 162 individuals deceased in 1999–2013, of which deaths 56 were suicides; in all of Sweden, a total of 2,978 individuals deceased in the same time period, of which deaths 726 were suicides.

In the analysis of the quantitative material, DOR was merged with variables from Statistic Sweden, with the analysis conducted using logistic regression<sup>27</sup> However, as appears from Table 11, the analysis here revealed no difference between males and females; only age appeared to affect the outcome.

Since there are no reliable statistical data on the number of suicide attempts or individuals with suicidal ideations, it is difficult to establish the extent of suicidal situations involving not completed suicides. However, as another interviewee stated during the interviews, there was nevertheless a way to estimate the number of attempts, plans, and suicidal thoughts:

[S]tatistics on suicide attempts tell nothing: no matter how many attempts a person makes, they are all counted as just one attempt in the statistics. So it's better to calculate them based on the 'ten coefficient' rule, according to which for each 1,500 completed suicides there are 15,000 serious attempts, 150,000 individuals with serious suicidal plans, and 1.5 million people with suicidal thoughts.

Using this rough formula on the known completed suicides in the age group in this research, then gave the following as the annual average for the city of Gothenburg and its vicinity: 40 serious suicide attempts, 400 adolescents with serious suicidal plans, and 4,000 adolescents with suicidal thoughts. On the national level, with its average of 52 suicides each year, corresponding figures would be 520 serious attempts, 5,200 persons with serious suicidal plans, and 52,000 adolescents with suicidal thoughts.

These estimates were also in line with how one interviewee, a community police officer often called in as a first responder in suicide situations, summarized his experience of a typical adolescent suicide: there were approximately three or four cases of completed suicides per year, although it was persons in the age group 13 to 19 years that those in his profession most often had to talk to in connection with suicidal attempts.

### *Defining and Differentiating Suicidal Situations*

In the analysis, suicidal events were categorized as having five components to them: method, place, motive vocabulary, intention, and degree of planning. By iteratively comparing within and between cases, a typology was constructed based on component reduction to the point where only two components remained as crucial: intention and degree of planning. In the systematic analysis, these two components were tested within and between different cases as an explanatory model, until the typology could be deemed as valid. At that point, it included four different types of events, all of which were labelled as suicidal events, yet were distinct from one another. These four types, named desperate suicide, para-suicide, traditional suicide, and instrumental suicide, were each associated different social conditions, suicidal locations, and spatial elements (Tables 12 and 13).

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<sup>27</sup> The outcome variable in DOR, i.e., cause of death, was defined as 'Death due to suicide' = 1, with all other forms of death cause = 0.

Table 12. Typology of suicides.

Primary aim to decease?	Degree of planning	
	Low	High
Yes	Desperate suicide	Traditional suicide
No	Para-suicide	Instrumental suicide

*Desperate suicides* in this study were most often committed in a capsuled space, such as a psychiatric care unit, a prison, or a detention cell, and they were typically triggered by loss of self-determination and temporary changes in the life situation (e.g., crisis response to being detained). Accordingly, their degree of planning was low, and through the suicidal act a form of control over the situation was restored. This made the act similar to the deviant act of defiance discussed by Tittle (1995). Moreover, what strengthened this relationship to defiance was the choice of lethal method and place. The modus operandi was in the majority of cases determined by availability of means of suicide (e.g., clothes with which to hang oneself, hygiene products or cleaning liquids to eat/drink), with the suicidal place determined by its availing the opportunity to carry out the act (as in dark corners of a yard, the bathroom, or one's own private room).

*Para-suicides and traditional suicides* occurred principally in the same places – in both the private and the public spaces of residential areas – but differed in the structure of the event. Para-suicides seemed to be characterized more by a desire to change an emergent life situation, while traditional suicides more often involved a high degree of planning and preparation, including both information leakage and a 'suicidal script'. The latter can be defined as a blueprint for the suicidal act that gives instructions for the performance of certain rituals and the like (Lester & Stack, 2015:6ff.). Traditional suicides tend therefore to be rather dramatic as a performance, intertwining societal, cultural, and sub-cultural elements related to contemporary societal norms regarding the lethal method, the location, and the performance itself, relying on suicidal notes/message, clothes, symbols, and other stylization (cf. Goffman, 1959; cf. Stack & Lester, 2015:6ff.).

These two types of suicide, however, also diverged in terms of their motives and triggers. Para-suicides were often triggered by losses, such as of one's love interest, or temporary adversities such as conflicts with one's peers or parents. Traditional suicides, however, are usually committed as a result of a long string of losses or adversities. In a sense, this also reflects the difference between experiencing an objective or a subjective strain and reacting to it (see Agnew, 2009). An objective strain refers to events or conditions disliked by most members in the group, while a subjective strain is about conditions disliked by the individuals experiencing them, with the reaction to the strain then being a joint function of one's individual traits and the character of the strain (Agnew, 2009).

*Instrumental suicide* in general appears to be the least common form of suicide, one in which the suicide itself is a means used to control a situation. This category is rather broad and includes suicide by cop (SBC), extended suicide (i.e., suicide following murder), and suicides committed before an audience or bystanders. It was brought up on a few occasions during the interviews for this study, mainly as ‘nasty’ or extended suicides. As one interviewee described it, there is ‘a really evil form of suicide where the person wants to make their family feel guilty for their actions, and then they plan them so that the children, the partner, or the parents are the ones who find them’. Similar views and experiences were put forth in other interviews; for example, ‘there is also a difference there – those who want to punish their relatives and choose to hang themselves in the living room so that the children find them’.

Similarly to the traditional suicide, the instrumental suicide was also in this study often associated with a suicidal script, but with an important difference. The choice of an instrumental suicide appeared to depend on the existence of an audience. This audience could be either active or passive (i.e., involuntary). Passive audiences were common in extended suicides, SBC and, as characterized above, ‘nasty’ suicides, whereas active audiences were quite typical in online suicides.

In online suicides the active audience in some cases participates in the event, interacting with the suicidal person and encouraging this to act, insulting the person, or alerting the emergency services. In the case of person C.L.’s suicide, triggered by an incident where her boyfriend missed her birthday, the young girl committed suicide live on Facebook. Nine persons watched her kill herself by burning charcoals in a closed space, none of them calling the emergency services, not even after her final post stating that now it was ‘Too late’.

In a same fashion, also person A.A. committed a suicide on Facebook, still chatting when inhaling car exhaust fumes, and again with no reactions from the audience; even when his messages grew more incomprehensible, no one in the feed reacted. In contrast, when the suicides of persons A.K.B. and M.J. were carried out broadcasting them ‘live’ on two separate Internet forums, the reactions in the discussion threads were more vibrant and interactive. What was also striking in these cases is that several of the people in these anonymous forum audiences called the police.

Although all four types of suicide and suicidal situation could occur in all kinds of places, there still seemed to be a general pattern in this regard. As Table 13 shows, place of occurrence was especially important for desperate suicides and para-suicides, which were also the types with the lowest degree of planning.

Table 13. Similar and different conditions related to the suicide typology in terms of modus operandi (M.O.), place, motives, scripts, and leakage.

	M.O. central	Place central	Loss of societal or cultural goals	Emotional loss Suicidal script	Leakage	Traceable motives
<b>Desperate suicides</b>		X		X	None	Temporary loss or restricted freedom, uncertain future
<b>Para-suicides</b>		X		X	In relation to the act	Change of life conditions, indifference
<b>Traditional suicides</b>	X		X	X	Yes, over a period of time	Martyrdom, better without me in life, useless as an individual
<b>Instrumental suicides</b>	X		X	X	Yes, over a period of time	Controlling others' life and using suicide as a means

In addition, the suicidal place seemed to vary according to the suicide type, based on the analysis of both the interviews and online narratives. Desperate suicides were generally committed indoors and outdoors in institutional settings, while para-suicides tended to be carried out in residential indoors as well as semi-public and public outdoors settings. Traditional suicides, on the other hand, were only committed in residential indoors and semi-public or public outdoors settings. Instrumental suicides were similarly committed both indoors and outdoors in residential settings, but also in other places such as public places or online, depending on the audience.

#### *Characteristic of the Adolescent Suicide*

Even if adolescents' suicides and suicidal events can be, and commonly are, of any of suicide types described above, they can in general be categorized as para-suicides and described as the opposite of the suicidal events described by those in the older age group (aged 20+) in the interviews for this dissertation. Adolescents' suicidal situations were described as impulsive, rapidly triggered by emotional loss (such as that resulting from breaking up with a boyfriend/girlfriend, fighting with parents, etc.), emotionally more detached, and characterized by indifference about the outcome of the act. In addition, completed suicides by adolescents were also sometimes described as a mistake or a result of a series of unfortunate circumstances, with the suicidal situation itself having presumably been meant to only help one to change one's personal situation, instead of actually resulting in a self-induced death. In the interviews and the workshops also a gender difference was brought up. Such was seen to be there in one's choice of a suicide method (males, it was suggested, used more extrovert and lethal methods than females), in the commonality of negotiations prompted by attempted suicides (more commonly engaged in by females), and in terms of the understanding that women's suicide attempts were in fact often more like deliberate self-harm acts that could sometimes also be repeated over a shorter time span,

indicating that suicidal situations are also bound to gender practice (cf. Messerschmidt, 1997, 2004:43). Such factors can be seen as signs of identity constructors, bringing to mind Durkheim's theses about the importance of social integration in relation to suicides (2004:155ff., 161ff., 244).

A 'typical' adolescent suicide might be defined as an egoistic suicide, occurring, according to Durkheim, as a result of a low degree of social integration (Durkheim, 2004:155ff., 161ff.). Here this integration could be understood as a factor of the degree of social isolation, social cohesion, or social support (cf. Wray et al., 2011). One factor behind a low degree of social integration is the tendency for individualism, which undermines social cohesion of groups and causes loss of meaning. Failed or incomplete social integration results in a loss of meaning, leading the individual to become melancholic and detached, with suicide then only appearing to be the logical consequence of these feelings and conducted in a melancholic-stoic manner (cf. Durkheim, 2004:244). What this also suggests, however, is that a para-suicidal situation, in fact, is then but a form of an endurance or survival strategy, a clumsy way of actually seeking contact and attachment.

For adolescents, one's degree of integration is not only about connections within the family group, but also about acceptance in social arenas important to them (cf. Newman, 2004). To be fully integrated as an adolescent also means having social status and succeeding in social and cultural goals. Adapting the framework of the egoistic suicide to adolescents' suicides helps the social phenomenon of adolescents engaging in suicide games or online suicides become more meaningful, since such forms of online activity attract adolescents experiencing a low degree of social support or integration in society: through them they are offered a possibility to participate in 'meaning' and a 'community'. As Douglas (1967) summarized it, suicidal actions are also socially meaningful actions. In consequence, due to their lack of traceable elements on an individual level in terms of the degree of planning, psychiatric history, and an aim to die, the situational and, especially, spatial elements of adolescents' suicidal situations are of great importance.

### *Modus Operandi, Spatial and Temporal Properties*

In the analysis of the interviews, a pattern emerged for suicides overall, linking modus operandi and place as closely entwined factors often defined by availability. One example of this was provided by one interviewee, who stressed the significance of availability and access in the selection of means: 'Maybe it's the absence of bridges [in certain areas] that makes the train tracks so popular, and vice versa'. Also age seemed to be a factor in this regard. As a second interviewee noted, 'Adolescents seem to prefer simpler solutions, such as walking onto train tracks or jumping off bridges, probably because they don't have an access to big amounts of pills and things like that.' This relationship between modus operandi and place was, moreover, described as a linear one for the adults, for whom the method came first and the place second: 'First there is a plan or a notion of a suicide, including an idea of the method, then the place is chosen, and after that the act is completed'.

For adolescents the process was seen to be an opposite one, with a decision about the suicide location being more important to them than the modus operandi, indicating that,

unlike with adults, there was no suicidal script. The choice of method as something determined by social factors was discussed already by Durkheim (2004:244), whose findings have been later elaborated further by Dublin, who distinguishes between three determinants of that choice: availability/accessibility, suggestion/infectiousness, and personal/symbolic factors (Dublin, 1963; cited in Lester & Stack, 2015:169). The first and third of these factors correspond to the way the interviewees in this study looked at the matter, although, in contrast to previous research, the Werther effect in it was more related to place than the method.<sup>28</sup>

In the interviews, suicidal places and knowledge of suicidal locations were suggested to be more important than method, since the choice of method, for the interviewees, always referred more to individual visions of suicide and was therefore linked to the suicidal script. Thus, as one interviewee acknowledged, ‘there’s a big difference between jumping and intoxications’. The examination of knowledge (and choice) of suicidal locations in the interviews revealed two distinct understandings of it: one presenting it as infectious information and the other one as infectious iconic locations. As one interviewee attempted to explain why suicides tend to cluster, ‘An X number of suicides were attempted by youths at the train station of Y, a site they had learned about from Facebook’. Iconic locations, on the other hand, were more connected to infectious knowledge in traditional media, and, in the estimate of study participants, they were likely more preferable to older suicidal individuals.

Three kinds of suicide locations were brought up in the interviews as the most common ones: the residence, residential institutions and the residential area (e.g., the immediate surrounding area). The three, in this order, also constitute a continuum progressing from private towards increasingly more public places, providing differing degrees of exposure to the suicidal situation. Of them all, it was the residence that was seen as the most common location. However, also here suicides by adolescents tended to conform to another pattern, choosing as they more often do to commit their acts outdoors. In the analysis, the locations were categorized based on different characterizations regarding the spatial conditions for suicidal locations: opportunity, accessibility, effectiveness, or strategicity (Table 14).

Table 14. Spatial conditions for suicidal events.

	<b>Desperate suicide</b>	<b>Para-suicide</b>	<b>Traditional suicide</b>	<b>Instrumental suicide</b>
Necessary spatial condition	Opportunity	Accessibility	Effectiveness	Strategicity

<sup>28</sup> The Werther effect, first coined by Phillips (1974), hypothesizes that suicides tend to be infectiousness, and that there is a positive correlation between media exposure and the clustering of suicides over time, especially when it comes to celebrity suicides or when the suicidal act otherwise gets glamourized. At the same time, the Werther effect has also been subjected to criticism, especially in the last few years, for example by Hittner (2005) who concludes that the hypotheses about it are questionable methodologically, statistically, and analytically.

The location itself could be used in different ways, as for example when trains were used as a lethal method by both para-suicidal and traditional-suicidal persons. In the interviews, the suicide by train option was described as involving two separate situations: jumping from platforms and being on the rails. Traditional suicides often occur on rails, not on platforms, since the speed of the train is a deciding factor in the success of the suicide attempt, likely making them more effective (and also more hidden as sites) compared to the para-suicidal situations centred on the platforms (accessible and visible). Moreover, this site's characteristics seem unaffected by temporality (the weekday/month/season, etc.), for which reason no significant difference could be discerned in terms of some weekdays' or months' being more popular for completed suicides.<sup>29</sup> Yet, as the interviews suggested, the hour of the day could matter in the situational dynamic, since 'one of the worst and most unfortunate phenomena we have is drunk youths on the bridges'.

#### 5.4 Elements and Mechanisms in Injury Situations

As Toneboe (1993:523, 531ff.) has argued, to enable an understanding of injury events and injury situations, one must interrelate the objective space as a place with temporality and social structure. However, the data used in this analysis was limited in the aspect of temporality, which affected the situational analysis. On the other hand, the analysis also confirmed the importance of place in injury events, especially for intentional injuries in capsuled space and movement space (e.g., residential institutions, schools, suicide hot-spots).

The context and object seem to create physical-environmental incentives and frame different injury situations, in terms of their layout, spatial organization, and integration. This is because built environments are designed from the perspective of intended use instead of 'misuse', and the built environment can therefore function as actant facilitating risky activities. The built environment also emerges with individuals' predisposition towards behaviour or actions related to the use of place, creating situated risky activities potentially resulting in an injury event. For this knowledge to be useful for the praxis of prevention, however, the rather abstract discussion needs to be specified and concretized, meaning that any measures need to be directed at specific elements. Here they include specific environmental incentives involving candidate properties, features, and mechanisms (see Table 15).

By specifying the candidate (e.g., the environmental 'primitives' related to action) and the features (e.g., features of the design or the configuration of design), two things become clear. First, all adolescents' injuries are preventable, though not all of them through adaptation of the built environment. Second, the mechanism in terms of the pre-choice process is significant if we are to understand the intention and ability to interact with, or read, the environmental incentives based on the personal predisposition or habitus, as opposed to merely being exposed to an (risky/dangerous) environment.

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<sup>29</sup> A Pearson's Chi<sup>2</sup> was conducted at DOR (n=56), showing no statistical significance for weekdays or months.



For example, just walking through an entrance is not enough for a fall injury to happen, but walking through an entrance with poor lightning can increase the risk for individuals with poor vision. The same would be true (though regardless of one's eye vision) if one enters the building on a skateboard instead of by walking.

As appears from Table 15, the sub-studies conducted for this dissertation were summarized within the theoretical IPTED framework, so as to not only be able to test the model empirically, but also provide an overview of the importance of place in injuries. This is crucial, since place frames these situated activities, creating either opportunities or lost opportunities for different events (cf. Goffman, 1963; Lefebvre, 1991; Merton, 1959), thereby directly relating situated activities and injuries to architectural performance.

Table 15. Necessary but not sufficient IPTED elements explored as part of the study.

	<b>Sub-Study No. 1</b>	<b>Sub-Study No. 2</b>	<b>Sub-Study No. 3</b>
Type of space	Containment and capsuled space	Capsuled space	Movement space
Causal properties in the environment	Mechanical elements	Precipitate elements	Precipitate elements
Candidate properties	Unintended mistake in containment space  Opportunity in capsuled space	Opportunity	Impulsiveness
Candidate features	Shared spaces, low degree of individual adaption	Non-visible or un-owned place	Accessible and known place
Mechanism	Predisposition, routine/habit, behaviour that unintentionally fails in containment space  Perception choice process, considered action in capsuled space	Perception choice process, considered action	Predisposition and perception choice process, considered action

Moreover, intentional injuries, in both capsule space (see sections 5.1 and 5.2) and movement space (section 5.3), appear to, at least potentially, be more easily preventable through environmental design. This is so mainly since the environment in these cases is an actant in the situation. All the same, such more promising results obtained for intentional injuries compared to unintentional injuries might also be related to a bias in the theoretical and methodological framework drawing upon criminological viewpoints related to RAT, SAT, and CPTED.



Figure 8. View from suicide hotspot B2. Photo: Charlotta Thodelius.

## PART THREE: DISCUSSION

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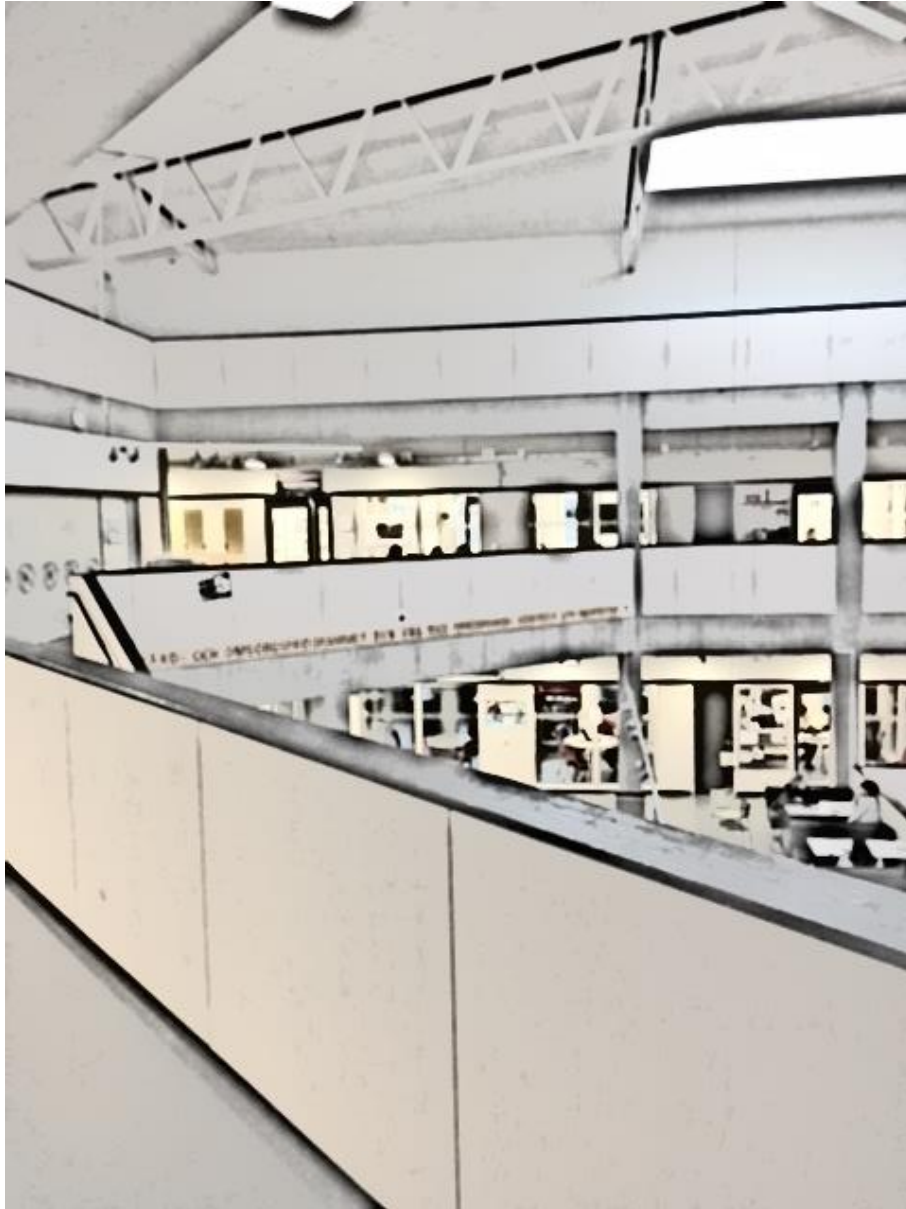


Figure 9. School A, an example of proper design for ‘to see and be seen’ across floors. Photo: Pernilla Alsterlind.

## 6. DEVELOPING PREVENTION STRATEGIES

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In what follows, the discussions, analyses, and findings laid out in the preceding chapters are subjected to a re-examination from the point of view of their ability to contribute to the development of effective prevention strategies. This requires both concretizing and theorizing the results obtained regarding candidate properties and features involved in socio-spatial practices resulting in risky situations and injury events. The focus is put on shared spaces as risky locations in containment spaces (e.g., residential areas), on shared spaces and outdoor environment in residential institutions, on the possibilities to prevent violent situations in schools by working with “owned” space, and on ways to work with accessibility of suicidogenic places (e.g., hotspots) in movement spaces in order to prevent suicidal situations.

### 6.1 Shared Spaces as Risky Locations

Residential shared spaces in this dissertation are considered to include entrances, stairs, and outdoor areas around, or in the immediate vicinity of, dwelling units. They are either semi-public or semi-private in nature, depending on their degree of proximity to the private home. These spaces are shared, or common, and therefore need to be made suitable to all persons in the building using some form of standardization. The same fact, however, also limits what sort of individual adaptations can be made in the private residences, thus at least potentially increasing injury risk for not only disabled or impaired adolescents, but also other individuals. Shared spaces thus constitute risky locations in which the risk element may be attributable to different factors at different stages of one’s life cycle, such as, for example, when one has children or ages.

Creating a safe environment without eliminating the positive effects of certain risky activities presents a major challenge for anyone engaged in the development of preventive measures. Indeed, often the issue comes across as a distinct trade-off between the two: a safer environment means fewer risky activities and vice versa. For this reason, too, it is important to remember that risky activities also have a positive function, in terms of supporting individual emancipation and the development of moral reasoning and self-confidence. To enable a productive balance between the two considerations, the perspective of inclusive design needs to be applied in injury prevention. Inclusive design, in my interpretation, includes activity-supporting design in terms of equitable use, flexibility in use, simple use, and tolerance for error (cf. Atlas, 2013:59–106; Buckley, 1986; Imre & Hall, 2001; Paulsson, 2006:40–41).

The kind of prevention strategies aimed at reducing injuries or reducing the consequences of injuries through design that I find to be of relevance here are those focusing on transitional zones, re-localization, and local risk assessments. Providing clear transitional zones between public, semi-public, and semi-private spaces, for example, helps to define not only ownership, but also the responsibility for management and maintenance, diminishing the likelihood of injuries due to poor place management, lack of handlers or guardians, and the like (cf. Atlas, 2013:65, 423; Clarke & Eck, 2016:42ff.). This strategy, based on CPTED elements related to territorial defence, maintains image improvement and connectivity, proposing that some injury risks are due to vagueness of responsibilities in shared spaces.

Such vagueness can contribute to both small problems like the lighting at the building entrance not getting fixed and bigger social problems such as the weakening of social cohesion (see, e.g., Atlas, 2013:59–106; Cozens & Love, 2015; Du Plessis, 1999; Jacobs, 1961:30–31; Newman, 1972). On the other hand, by relocating gathering areas and unsafe activities to safe locations and, reversely, safe activities to unsafe locations (cf. Atlas, 2013:423), it becomes possible to provide for good natural surveillance while also allowing for risky activities and edgework, although now with mitigated potential consequences. In any case, to be successful in prevention work, the interventions need to be tailored by assessing the risky situations locally instead of at a general level. One needs, moreover, to also combine data, since both statistical and perception-based data are useful for assessing the issues at stake, helping to neutralize the impact of conflictual user groups and take into account all relevant factors such as those having to do with the local culture and threshold capacity.

## 6.2 Adolescents' Residential Institutions and Risks

In residential institutions, shared spaces is often limited to the corridor, the day room, the backyard, and the entrance, all of which are environments potentially lending themselves to both unintentional and intentional injuries. In addition, also the residents' private rooms are risky locations, mainly in the case of adolescents' intrapersonal injuries. In contrast to 'ordinary' dwellings, residential institutions need to be capable of handling different situations arising from temporary loss of freedom, crises, or illness in combination with employees' working conditions, social organization of work, and care ideologies. Clients can, for example, react negatively to their loss of freedom and self-determination and become violent or self-destructive in the institution, while such situations need to be defused maintaining safe working conditions for the staff and with the purpose of the care the institution is designed for in mind. In some cases, any further securization of these institutions can come as to the benefit of the staff, but as something dubious from the point of view of their clients, who may also see them as provocative or as signs of the staff's use of symbolic power. Design, therefore, needs, among other things, to take into account the different aims characterizing residential institutions (provision of care, rehabilitation, or habilitation) and the time residents spend in them (temporary or long term stay), in relation to the conditions and situations prevailing or possibly resulting in the institution.

As seen in sections 5.1 and 5.3 above, institutions for adolescents need to use the built environment to hinder not only unintentional, but also interpersonal and intrapersonal injuries. Unintentional injuries in residential institutions appear to display a pattern similar to that in dwellings: they are often attributable to mere exposure and everyday activities. Intentional injuries in them, however, are more connected to environmental incentives creating opportunities, such as the presence of hidden areas, areas encouraging crowding, or interiors lending themselves for harming oneself or others. All of these can be minimized or counteracted through design, as indoors events associated with intentional injuries appear in these environments to a large extent to be related to crowding, lack of control, or certain kind of spatial flows or lack thereof (Thodelius, Andersson et al., 2017). Outdoor events, on the other hand, have more to do with failures to strike a right balance between aesthetics and

security and/or client privacy and staff surveillance (Thodelius, 2018; Thodelius, Andersson et al., 2017).

My foremost recommendations for the design process are to decrease social density in shared areas, thereby reducing opportunity for violence in the absence of crowding (i.e., work with social density); to work with the plan layout to create possibilities for more flexible use of the institution or ward (i.e., enable the redistribution of activities) or to use interior design solutions, such as more flexible furnishings, through which individuals can better control their ability to be alone versus engage in interactions; and to increase the flow in corridors used by staff members (i.e., enable a higher degree of surveillance) through improved spatial organization of work processes (cf. Deitch et al., 2013; Potter & Atlas, 2013, Stark, 1987; Tartaro & Levy, 2007; Werner et al., 1985, 1987). In addition, it makes sense to design outdoor areas (the yard) so that they can provide both aesthetic pleasure and security without allowing the two aims to clash. There is no reason for why the layout of the yard of the residential institution could not be appealing for the clients while still allowing for, even promoting, natural surveillance by the staff. Some ways to accomplish this could be to keep the trees and bushes smaller so as to create free sightlines from the windows nearby, to avoid trellises, and to create more open spaces for recreation surrounded by flowerbeds that discourage self-harm incidents and suicidal situations.

### 6.3 Reducing Risks for Violent Situations in Schools

In this study, the candidate design features in violent situations in schools were, in general, related to the presence of non-visible or un-owned places in the school settings. Such places were not spatially integrated into the school settings per se the same way other spaces signalled their clearly designated function and use. Two hotspots for interpersonal injuries suggested themselves as particularly significant from the prevention point of view: hallways and student lounges. These shared the same criminogenic trait (candidate features): they were places with no structured activity, being instead characterized by street-corner interaction. In addition, corridors often lacked a proper transition zone, given that schools, at least in Sweden, today house a variety of activities and actors such as public libraries, organized evening activities and events, and so on, causing the public zone to meet the private zone (classrooms) directly and thereby creating a feeling of uncertainty about the ownership aspect and about the prevailing expectations and rules.

As suggested by previous research, prevention of violent situations in schools requires 'proper design' based on local risk assessment (Crowe & Fennelly, 2014; Fennelly & Perry, 2014:319; Watson, 2014:21). At the same time, deviant behaviours can share certain general traits, notwithstanding the fact that individual schools tend to have their own particular social dynamics (cf. Purpura, 2014:11ff.). From an IPTED perspective, these traits can be discussed in terms of criminogenic elements related to the built environment, allowing for prevention based on the application of functional zoning as illustrated by Figure 10.

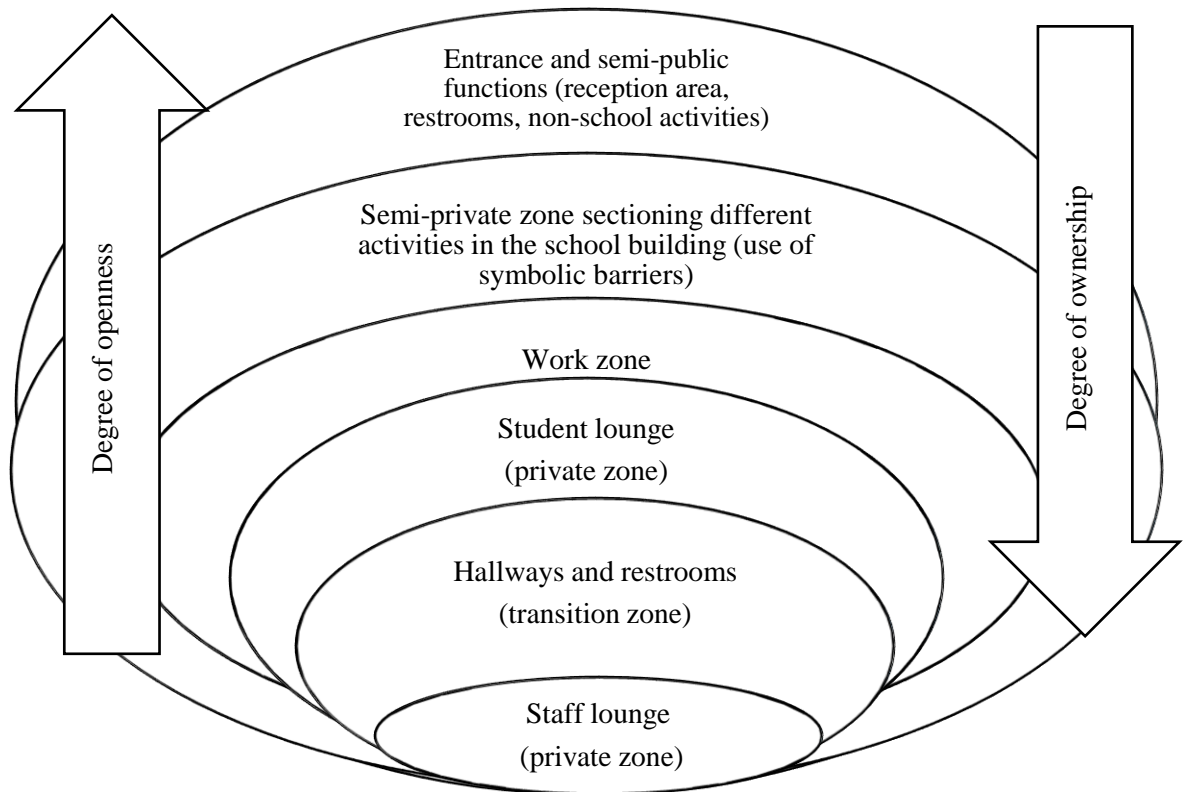


Figure 10. Functional zoning to prevent violent injuries in school buildings.

The intended activity in question needs to be marked and highlighted through the features of the built environment, for instance by creating environmental incentives for activity support. This can be achieved by sectioning and organizing different functions so that they conform to a spatially logical pattern. The classrooms, for example, can be located next to the teachers' workroom in the same hallway (forming a *work zone*), followed by separate lounges for the students and the staff (forming a *recreation zone*). These zones, however, need to be linked, in order to create a flow between the layered zones and clear borderlines so that the place is always clearly marked as owned.

Also the flows in the entrance and the corridors must be planned based on a real risk assessment, not socially constructed risks. The functions associated with the entrance should be planned from the perspectives of *what* activities by *whom* the school building is to be used for and how can those activities be controlled through architectural means without interfering with adolescents' need for privacy (need to respect their 'freedom from adults') while at the same time also not creating hidden spaces that can be problematic. To some extent, school buildings tend to have the same characteristics as residential institutions – which too are capsuled spaces – and so their design needs to incorporate the consideration of three distinct aspects: adolescents' day-to-day life, workplace conditions for the staff, and social organization in terms of staffing, pedagogical aims, and the catchment area. Moreover, the school building design also needs support the complex task of providing a safe, secure, pedagogically appropriate, and relational space while accommodating the different activities taking place in it.



#### 6.4 The Possibility/Impossibility of Preventing Suicidal Situations

Compared to the other risky locations for adolescents' injuries (i.e., shared common spaces and capsuled environments) in which the risks were associated with a low degree of spatial integration, the suicidal locations in this study tended to better integrated and have clearer boundaries and transition zones defining the place as a movement space. According to the interviewees, para-suicides often occurred in highly visible locations, ones that were used for 'conform' activities in general and were closely related to daily routines, such as waiting for the commuter train, passing by on the way to the mall, and so on. It was their accessibility and visibility, but also the general familiarity with them (their 'knownness'), that made these locations desirable for those committing spontaneous para-suicides. It is thus important to keep in mind that suicide locations are also everyday settings.

It is likewise necessary to stress here the importance of place in suicidal situations in general, not just in para-suicides. According to previous research, two in every three suicidees carry out their act in the vicinity of a residential area, with especially bridges being a popular location in this regard (e.g., Nowers & Gunnell, 1996). Indeed, the very act of suicide can often be viewed as an outcome of the accessibility factor: more individuals appear to commit suicide when there are more options available for the purpose in the immediately surrounding area (Clarke & Lester, 1989). For example, more guns correlates with more gun suicides, more cars with more suicides by carbon monoxide, more high buildings in the area with more suicides by jumping (Clarke & Lester, 1989; Oliver & Hetzel, 1972, 1973; Whitlock, 1975; Yamasawa et al., 1980). This makes the quest of reducing the number of suicides not only a matter of increasing or improving social or psychiatric interventions, but also into something requiring the input of engineers, urban planners, and architects.

At the same time, however, unclear roles and responsibilities in and for the implementation may negatively affect place-based measures. Another major challenge appears to be to find a way to prevent para-suicides without simultaneously contributing to an increase in the number of traditional suicides, since the two suicide types are each other's opposites. As discussed in Article VI, the use of proper fencing, for example, tends to hinder para-suicides, but it does not affect the traditional suicides on railways or at railway platforms; correspondingly, better lightning on platforms tends to decrease the frequency of traditional suicides, but it might increase the tendency for para-suicides; and so on. It is therefore necessary to first conduct a thorough analysis of each location to define which types of suicide or suicide attempts are characteristic of the site and whether their occurrence there is bound to certain temporal aspects (whether they tend to occur during the day, nights, weekends, etc., and whether the question is a of a temporary phenomena or a more stable trend). The following prevention strategies, building on the findings reported above in Section 5.3, derive from the observations conducted in connection with Sub-Study No. 3. In the interviews on suicidal situations of adolescents, four concrete examples of suicidogenic places were provided: railways, institutions, bridges, and mountains. In this section, two of these are taken up as places strongly connected to para-suicides: a railway section (A) with its related platforms (B1, B2) as well as a bridge (C)<sup>30</sup>.

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<sup>30</sup> The bridge was 'suicide proofed' during the research period, becoming equipped with preventive fences.

The two platforms B1 and B2 located at the endpoints of the railway section A were differently integrated into their surrounding environment, and therefore the suggested strategies to prevent suicidal situations on them must differ. The platform B1 stood near a shopping mall and a bus stop, and thus could be said to have some natural surveillance on it. However, this surveillance was not possible round the clock, as during evenings and nights visibility was low due to poor lightning in the area. Also on the platform itself the lighting conditions were quite poor, making it hard to see if anyone else was nearby and resulting in a sense of its being abandoned. Also the platform B2 lent itself to such a sense. However, it was further removed from any crowded areas, being separated from them by a parking lot next to it, which at night-time was used as a hangout place for adolescents (i.e., as a liminal space). This made place integration there dependent on temporal conditions: during daytime, the place appeared as part of its surroundings, but during evenings and night-time it was cut off from the other sites of natural activities or movement in the area. In addition, also the tracks on A were accessible from the parking lot next to B2, since there were no fences or comparable to control the access. They were also concealed from the nearby highway, and were only partially fenced off. This made it possible to access them from several paths along B1 and B2. In other words, these sites were not only well known and accessible, but also functional as suicide locations because of their obstructed visibility and their character as temporal liminal spaces. Bridge C, too, was a well-known place for suicides. This was so despite the fact that it was trafficked 24 hours a day, and thus allowed no room for privacy for the act. Yet, it enabled its use for suicides on an opportunistic basis (impulsive suicides or suicide attempts) since it was accessible not only by public transportation, but also by foot.

The most difficult task in suicide prevention in these kinds of context is to keep the ordinary functions of such settings as places for everyday activities undisrupted, while at the same time preventing suicidal situations and also generally increasing their attractiveness. The latter is not only to increase the flow of people in them during the hours when they otherwise are abandoned, but also to avoid their territorial or place stigmatization. For this reason, the measures to be taken need to ensure, not disrupt, functionality while nevertheless addressing the features of the place that attract suicidees. Tentative strategies to prevent adolescents' suicides in our exemplary case involving A, B1, and B2 could include addition of fencing between the tracks and the commuter parking lot, and better lighting, perhaps triggered by motion sensors at night-time. At bridge C, higher fences would make it harder to climb over, although any such added fencing also needs to be aesthetically pleasing so as to not repel pedestrian traffic on it but instead encourage continuous natural surveillance. However, as we know from previous research, fencing bridges overall appears to have no displacement effect for suicidal situations; rather, it seems to create a diffusion of benefits by lowering the number of suicidal situations in general (Beautrais, 2001; Lester, 1993, 2009; O'Caroll et al., 1994; Reische & Michels, 2005). Emergency phones on or by bridges might be a good idea as well, since suicides by jumping are typically acts carried out on impulse, for which reason another solution for the temporary distress can be preventive in the situation (cf. Redley, 2003).

## 7. REVISITING AND REFLECTING

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The aim of this dissertation is to explore and explain adolescents' injury events as situated activities, so as to enable the development and formulation of prevention strategies based on modification of the built environment. More in particular, the research for it focused on the possibility of theoretically and methodologically developing IPTED further as a basis for a new injury prevention strategy. As part of this goal, architectural theory and praxis were brought to bear upon public health issues, with the resulting model then tested empirically. In this final section of the dissertation, its main findings are discussed in relation to theory and previous research and in terms of their practical implications.

### 7.1 Re-visiting the Sub-Studies

This dissertation is based on three separate sub-studies looking at different injury situations in adolescents' everyday life. The settings involved different spaces, different degrees of spatial integration, and different spatial and social organization of everyday life, while pointing to the importance of a systematic theoretical framework capable of narrowing down on the causal factors operative in injury situations. In addition, and perhaps more importantly, the sub-studies, taken together, demonstrate the importance of architectural design theory and the validity of architecture for any prevention problematic and efforts.

The first sub-study concentrated on injuries in residential situations, including both injuries in private residential spaces and residential institutions. In private residential settings, there is always less room for prevention strategies to be both developed and applied, for which reason they tend to be more productively implemented in semi-private settings such as building entrances. In line with previous research, the injuries (their nature and incidence) in private residential settings in this study showed the influence of factors such as age, gender, and the possible presence of disability or impairment (cf. Chou et al., 2014; Ferrante et al., 2014; He et al., 2014; Petridou et al., 2003; Rowe et al., 2004; Yung et al., 2014), but not socioeconomic position in fall injuries (for a discussion of SES as a risk factor for injuries in general, see, e.g., Hjern et al., 2001; Osbone et al., 2016; Reimers & Laflamme, 2005; Russell et al., 2015). Consequently, injuries in these settings might be more directly connected to temporal exposure for risk (e.g., miscalculation in a situation) owing to risky edgework or risky behaviour related to age and gender instead of any extrinsic factors. Risky behaviour in adolescents is not only part of a developmental stage during which one's identity and autonomy are socially established; it is also a biological and cognitive predisposition. Adolescent brain development is uneven, with the growth of the limbic region and the prefrontal cortex taking place at different stages of human maturation: the limbic region, which enriches and exaggerates emotions, develops earlier than the prefrontal cortex, which control emotions or create judgements (see, e.g., Felson & Eckert, 2018:191 ff.). This is then one significant factor contributing to individuals' risky behaviour.

A more promising context for preventive interventions is then the institutional settings. In them, the spatial dimension seemed to play a notable role in the occurrence of interpersonal and interpersonal injury situations. Similar results were obtained for schools, in which the number of injuries was lower in environments in which design resulting the creation of 'unowned' places had been avoided (cf. Astor et al., 1999). Moreover, both residential

institutions and schools are capsuled environments, strongly involving not only spatial, but also social and organizational aspects, which only contributed to the importance of the spatial aspect as an actant both facilitating situations and preventing them from arising.

The last one of the three sub-studies, on suicidal situations, focused on place as an external factor of importance (cf. Lester, 2009:7–8; Lester & Stack, 2015). As the study shows, place-based interventions are of major importance as measures to prevent adolescents' suicidal situations. In this research, this was mainly because para-suicides tended to be committed in known and accessible places in nearby areas. Moreover, by defining suicide as a socially meaningful action (cf. Douglas, 1967), the analysis could distinguish several basic types of suicidal events. Thanks to this, a more nuanced picture of the phenomenon could be obtained than in bio-medical and psychiatric analyses done in the field, with the role of external factors in the event coming into view. All this, to be sure, is firmly in line with the perspective of the rational-choice tradition in criminology, and is inspired by previous work in the field on suicides as acts dependent on place and means (Clarke & Lester, 1989; Lester, 2009; Lester & Stack, 2015).

Nevertheless, it was not only the third sub-study that found suicidal individuals to be agents acting rationally; also the other two relied on the same assumption, through the theoretical framework laid out in them. Accordingly, my argument can be said to be that individuals always make rational choices for their actions based on the situation they find themselves in. This aspect of rationality can be hard to grasp from the outside, but for the individuals themselves their choices are the 'right' ones in the moment, even though these might be based on partial information only and thus not something freely made from among all imaginable alternatives. As Felson has noted, '[p]eople make choices, but they cannot choose the choices available to them' (1986:119). Socio-spatial practice tends in general to be characterized by its rationality, which mediates and is mediated by the surrounding environment. This performativity of space, in terms of both behaviour and action, moreover also relates to the intended appropriation of place and the unintended opportunities for events as created by place (cf. Cohen & Felson, 1979; Goffman, 1963; Lefebvre, 1991:164ff.; Merton, 1959; Werner et al., 1985).

Architecture is therefore not only about design or physical structures: it is also about situating individuals and giving them a situational choice in the emergent conditions resulting from the interaction between individual predisposition and environmental inducements (cf. Turner, 1987:12; Wikström, 2006, 2011). More important, however, is that architectural praxis and artefacts be related to rationality and perception–choice processes in a manner that allows all artefacts to emanate from a vision of intended use, not misuse, and conform to socio-spatial practice instead of not conform, and so on. Only that way can full understanding of environmental design as an approach to prevention emerge.

Another aspect in the research work carried out that needs to be reflected upon a little more is the concrete development of, and practical suggestions for, prevention strategies related to IPTED. There is, to be sure, always the risk that any such suggestions may be seen as no more than ultimately rather trivial solutions or basically just another version of already existing proposals, with nothing new to offer for architectural praxis. Even if it might appear

so and the strategies suggested herein were to be partly familiar to some from previous research already, the research conducted for this dissertation affirms the importance of at least three things: 1) the complexity of situations needs to be reduced by theory; 2) mechanisms are of definite interest in prevention work; and 3) triviality does not entail ineffectiveness. As I see it, by directly building or extending on previous work in the field, although using other types of data or different methods, one can ensure that the core ideas hold across contexts and similar that good theory always enables reduction of complexity in research.

The main limitations of this dissertation research have to do with its data and the methodological considerations and choices made for it. For example, Swedish health records in general do not include any spatial or temporal variables, and where they exceptionally do, these are not as well defined as would be needed for the research to be exact enough. Moreover, as Cameron (2011) has pointed out, the choice to use a MM approach is not unproblematic in research in general. There is, for instance, a constant risk that the work ends up being merely eclectic and/or epistemologically relativistic, or it might succeed poorly in integrating methodological choices with data and produce superficial claims. To reduce such risks in this dissertation, the methods chapter above made an attempt to concentrate a bit more on the interface between aims, theory, and methodology, along with the rationales behind the research design and the applied analytical techniques.

## 7.2 Re-visiting IPTED: Next Steps in the Development

The adaptation and operationalization of CPTED to IPTED, combined with an analytical understanding of causation in RAT and SAT, provides a model for systematic research about injuries with specific pre-conditions: either intentional injuries or injuries occurring to individuals with specific pre-dispositions that interact with or are influenced by environmental incentives. What this means, though, is that IPTED remains limited as a perspective, one that is not applicable to all injury situations, since the model is unable to accommodate exposure as an environmental inducement, only incentives, and thus needs to be developed further in to be able to become applicable to all inducements in general.

In previous theorizing, any distinctions between different environmental inducements have been vague at best. I argue that a tentative distinction can be founded on the perception–choice process. In it, exposure is latently embedded in the environment, and also unaffected by the perception-choice process (e.g., injuries as unintentional and more actor dependent), in contrast to incentives. Incentives are manifest facilitators or barriers in the environment (the built environment as an actant) and dependent of the perception–choice process (situated emergence between actor and actant).

This distinction between exposure and incentives is, furthermore, of importance in the context of prevention work, in which it is needed to close the gap between social and situational countermeasures. Active strategies (such as social policy aiming at changing people), it would seem to me, can be applied on the part of exposure, while incentives call for passive strategies (those aiming at preventing risky situations). However, situational measures need to be further related to so-called ‘script clashes’. Independently of

individuals' internal processes of self-control and moral choice, the environment should always be so shaped as to steer or favour action in the desirable direction (Ekblom, 2011b:151; Wikström, 2006). In other words, the design of the place needs to hinder misuse of incentives and, instead, facilitate the intended use, to reduce certain injuries in adolescents' everyday life. Towards this end, adolescent scripts need to be analysed further to better understand script clashes involving them.

To be successful, IPTED needs to be developed further, and not only in terms of the solidity of its theoretical and methodological framework, but also as concerns the way it is implemented in practice and how the suitability of the various measures is assessed. Moreover, the architectural tacit knowledge needs to be articulated as explicit knowledge, to avoid loss of expertise in the theoretical and methodological development of design projects or ending in failures in reconstructing success (cf. Sennett, 2008). Accordingly, one might view design as a problem-solving process, one that needs to be capable of handling 'the real world' and taking on new, complex problems in novel or changing contexts (cf. Ekblom, 2011b).

### *Dark Side and Pitfalls in Prevention through Environmental Design*

As noted by Cozens and Love (2015) in connection with CPTED concepts, IPTED, however, to see if it is effective, needs not only to be capable of advancing evaluation strategies in general. It also needs to have an ability to do that on a specific level to avoid limitations in evidence (e.g., measures need to have a specific aim that is measurable, with respect to context factors or data-specific factors). As suggested in Chapter 2, all preventive strategies need to be designed with different aspects in mind, while these aspects also need to provide the foundation for the evaluation. What works in place A might not be effective in place B, and a strategy effective for one group may not be so for another, and so on. However, it is also important to note that not only are almost all prevention strategies relying on environmental design to be met with scepticism based on the assumption of the rational actor: they also have what we might term as a 'dark side' to them. Nevertheless, since the IPTED-related strategies and suggestions in this dissertation have not been implemented or evaluated anywhere, the following discussion must rely on lessons learned from evaluations done in connection with CPTED.

The dark side of CPTED is about undesirable outcomes of implemented interventions, such as displacement, increased/strengthened polarizations or exclusion, and neglect of the process. Both the displacement effects (whether spatial, temporal, tactical, or target, type, or perpetrator related) and the risk of reducing one type of crime while increasing another one with the intervention, are difficult to not only foresee and predict in advance, but also measure afterwards, following the intervention. However, this dark side can be minimized by systematically analysing the problem itself, ensuring a clearly circumscribed geographical context for it, and focusing on specific intervention outcomes (cf. Ekblom, 2011b; Love, 2016; Wikström 2007). There is thus a need, and not just in CPTED but in all types of prevention work, to provide a sound basis for identifying missing or faulty data, actors' prejudices, and any lack of consensus regarding the definition, mechanisms, cause, and effects of the problem.

Secondly, where CPTED is conceived as merely the physical result, outcome, or product of a process, instead of the process itself, one that, moreover, includes the local community, it may, contrary to its intentions, lead to reduced quality of life, by creating excluded communities through over-fortifications and the use of exclusionary methods. For example, the use of CCTV or other place-based measurements “just in case”, or in cases where there is little evidence of their assumed effect, can result in feelings of exclusion, learnt helplessness, or stigmatization of the place.

Moreover, neglecting the process nature of prevention can also lead to an institutionalization of preventive strategies in different professional fields, such as in police departments, housing departments, or academic departments, resulting in rigid processes, lack of flexibility, or dogmatic planning based on out-dated principles (see, e.g., Cozens & Hillier, 2012; Deming, 1986), which all undermines the good intentions. As this risk is very real, it all the more needs to be managed and, better still, eliminated, such as by approaching prevention as a matter of tackling the interface between human, object, and context, and by remaining mindful of the fact that prevention needs constantly to be re-thought and re-evaluated in concrete situations.

### 7.3 Conclusion and Implications for Further Research

As suggested by this dissertation research, all adolescents’ injuries are preventable, although not all of them through the adaptation or modification of the built environment. In private residential settings, shared or semi-private spaces can be defined as risky locations that conceivably lend themselves for prevention through use of transitional zones, re-location of activities, and more developed local risk assessment techniques. The primary beneficiaries of these kinds of interventions would be mainly adolescents with different disabilities and impairments. In residential institutions and schools, intentional injuries can be prevented using a strategically more focused and more closely defined design that can reduce social density and increase staff member flow. Capsuled spaces, for their part, whether residential institutions or school buildings, need to be well managed and therefore have a design that facilitates management and improves the flexibility of their shared spaces. Suicidal situations, on the other hand, which in many ways differ from the situations tackled in the other two sub-studies (focusing as they do on a built place of occurrence instead of an injury type instead), as far as the spatial integration and organizational aspects are concerned appear to potentially best lend themselves for prevention approaches based on environmental modification. This may be because they represent an injury situation most intimately related to design features related to place accessibility.

Future research in the field of injury prevention needs to proceed based on a more trans-disciplinary and intra-disciplinary approach if it is to be successful, and concentrate on theoretical and methodological development. The two factors of space and place are all too often given scant attention in prevention discourses, and architectural theory and design theory need to not only recognize the relevance of other disciplines, but also be themselves recognized by criminology, sociology, and public health as to the specific contributions they can make in the field.

Any work to develop prevention strategies, however, also needs to address the tension between values we want to retain and values we want to develop further. Is it possible to simultaneously promote both aesthetics and accessibility, both diversity and ease of environmental orientation (e.g., through clear signage), both safety and security, or is there always an unavoidable trade-off? In addition, we also need to rethink injuries and injury prevention in relation to societal changes and upcoming challenges such as increasing urbanization, growing population densities, and new routine activities.

The best way to productively respond to such emerging social and societal, but also ethical, challenges is, I have argued, to work with IPTED and comparable prevention strategies. In this, I am in agreement with Cozens (2014:21) who envisions further development of ‘CPTED as process for analyzing and assessing crime risks in order to guide the design, management and use of the built environment (and products) to reduce crime and the fear of crime and to promote public health, sustainability and quality of life’. For my own part, in my capacity as an academic focusing on a field of inquiry somewhat different from Cozens’s, I look forward to similar prospects for IPTED.



## SVENSK SAMMANFATTNING AV AVHANDLING

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Avhandlingen undersöker skadehändelser bland ungdomar som uppstår i interaktionen mellan individen och den fysiska miljön. Fokus ligger på att finna nya sätt att förebygga tre skadesituationer i ungdomars vardagsliv: skador i bostadssituationen, skador i skolsituationer samt förhindra eller försvåra suicidala situationer. I kontrast till tidigare forskning inom fältet, som i hög grad har präglats av en disciplinär ensidighet, försöker avhandlingen integrera flera olika disciplinära och teoretiska perspektiv (*interdisciplinärhet*), samt ta till vara på den praktiska erfarenhet som finns inom fältet (*transdisciplinärhet*). Skadehändelser, i likhet med andra sociala företeelser, orsakas av en lång rad faktorer på mikro-, meso- och makronivå, och måste därför förstås utifrån ett helhetsperspektiv med förankring i både teori och praktik.

Avhandlingens inter- och transdisciplinära ansats baseras även på en ny förståelse för arkitekturforskningens roll i det förebyggande arbetet. Arkitekturforskning är inte en enhetlig forskningstradition, men de centrala begreppen speglar alltid interaktionen mellan människa, fysiskt objekt och kontext i olika kombinationer. I avhandlingsarbetet benämns denna interaktion socio-spatial praktik, och skadehändelser blir då en konsekvens av särskilda situationer där individ, objekt och kontext sammanfaller. Vidare är dessa situationer präglade av rutinaktiviteter, situationella aktiviteter och beslut som påverkar utgången av händelsen.

### **Avhandlingens syfte**

Syftet i avhandlingen är att utforska och förklara hur ungdomars skadehändelser är situationerade, samt hur den byggda miljön är en del av situationen. De resultat som framkommer ligger till grund för en diskussion om lämpliga preventionsstrategier relaterade till utformningen av den fysiska miljön. Avhandlingsarbetet har strukturerats runt tre separata delstudier, som belyser olika typer av risk- eller skadesituationer i ungdomars vardagsliv.

*Delstudie 1:* undersöker skadehändelser i bostadsmiljön, med hänsyn till de riskfaktorer som tidigare studier har påvisat. Dessa riskfaktorer är bland annat kön, ålder, funktionsvariationer, socioekonomisk position och faktorer relaterade till den fysiska miljön. Relationen mellan faktorerna kan ses som olika aspekter av ungdomars benägenhet för risker eller skador genom att faktorerna påverkar beteendet och samspelet med den byggda miljön.

*Delstudie 2:* fokuserar på risken för våldsskador i skolmiljön och inkluderar ett spektrum av händelser, från mobbning till dödligt våld. Främst undersöks vilka platser dessa händelser sker på, i och runt skollokaler, samt vilken betydelse dessa platser har för händelsens uppkomst, utveckling och avveckling.

*Delstudie 3:* analyserar platsens betydelse i suicidala situationer. Den främsta frågan i delstudien rör vilka platsspecifika faktorer som kommer att avgöra om platsen används vid suicid eller suicidförsök. Även om suicid är utlöst av inre faktorer, såsom psykisk ohälsa, möjliggörs händelsen av externa faktorer, såsom tillgång till dödliga metoder och plats.

## **Teoretiskt ramverk**

Det teoretiska ramverket består av två delar. Först presenteras en teoretisk framställning om hur skadehändelser kan förstås genom interaktionen mellan människa, den fysiska miljön och kontext. Därefter beskrivs hur byggd miljö kan användas som skadeförebyggande praktik, genom att adaptera ett brottsförebyggande koncept till ett skadeförebyggande koncept.

Platser är inte spontana utan formas av meningsskapande och aktörskap. Den platsskapande processen kan förstås som två parallella processer, där rummet (e.g. *space*) reglerar aktiviteten och aktiviteter skapar mening samt platser i rummet (e.g. *place*). Platsen, i sin tur, samspelar med individen och individen har vissa benägenheter för både beteenden och handlingar och miljön kan sägas ha olika möjligheter eller ledtrådar som individen tolkar och agerar på. Interaktionens utfall, situationen, villkoras av både individen själv i form av social position eller habitus, tidigare erfarenheter av liknande situationer och den fysiska miljön. Händelser och handlingar är alltså situationerade och beroende av aktörens tolkning och val, men även av dennes oreflekterade vanebeteenden. Därtill är de villkorade av miljön, eftersom den – och framför allt den rumsliga utformningen av platsen – påverkar aktiviteter och beteenden genom att skapa möjligheter, eller förlust av möjligheter, för genomförandet av enskilda handlingar.

Utifrån det teoretiska antagandet om händelser som situationerade och villkorade av den fysiska miljön, så hävdas i ett andra teoretiskt steg att prevention mot skadehändelser kan och bör ske genom miljödesign. Genom att förändra den fysiska miljön kan vissa händelser förhindras, försvåras eller konsekvenser av händelser reduceras. Utgångspunkten för denna teoretiska ingång grundar sig på det kriminologiska konceptet *Crime Prevention through Environmental Design* (CPTED), som anpassas till konceptet *Injury Prevention through Environmental Design* (IPTED). IPTED, precis som CPTED, betonar orsakssamband och mekanismer i situationer.

## **Material och metod**

Avhandlingsarbetet bygger på en så kallad multistrategisk forskningsdesign. Det innebär att forskningen genomförs på olika nivåer beroende av forskningsfrågor eller tillgänglig data. Olika nivåer, kontext, setting, situationerad aktivitet och självet har studerats i olika kombinationer för att ge en så heltäckande analys som möjligt. Utgångspunkten är att analysen genomförs med mixad metod, där kvantitativ och kvalitativ analys blandas i olika kombinationer. Materialet är insamlat som sekundär registerdata, bestående av skadedata från sjukvården samt demografiskt, geografiskt och bostadsrelaterat data från Statistiska centralbyrån (SCB). Primärdata består av kvalitativ data särskilt insamlad för avhandlingsarbetet och materialet kommer från forskningscirkel, intervjuer, workshops, observationer, dokument samt online-miljöer. *Delstudie 1* analyserar främst kontext och setting, eftersom studien fokuserar på vad som villkorar skadehändelserna utifrån tidigare definierade riskfaktorer och faktorer i bostadssituationen. *Delstudie 2* koncentreras på setting och situationerad aktivitet i termer av skadehändelsernas rumslighet i skolmiljön. *Delstudie 3* berör främst suicid och suicidförsök som situationerad aktivitet i närområdet.

## Resultat

Resultatet från den första delstudien om skadesituationer i bostadsmiljön visar att individens sociala position eller habitus villkorar skadehändelserna, eftersom de skilda förutsättningarna leder till olika interaktioner med den byggda miljön. Individens habitus påverkar inte bara olika former av livsvillkor eller livsstilar utan även olika användningar av rummet utifrån rutiner och handlingar. Användningen påverkas även av (temporära) förändringar i omgivningen, såsom utomhustemperatur eller avsaknad av social kontroll, då även kontextuella faktorer påverkar rutiner och handlingar. De tre platser som skulle gynnas mest av ett förebyggande arbete med inriktning mot designfrågor för att minska skadehändelser och risksituationer är: *entréer och trappuppgångar i flerfamiljshus, gårdsytor i närheten av bostaden samt ungdomsinstitutioner.*

Den andra delstudien påvisar att vålds- och risksituationer i skolmiljön främst förekommer på icke-ägda platser. Exempel är korridorer, uppehållsrum, omklädningsrum och toalettcentraler. Ägda platser har en hög grad av strukturerad aktivitet där både elever och personal känner till förväntningar och där det förekommer en viss interaktiv övervakning och självreglering i rummet. De icke-ägda platserna däremot är platser för ostrukturerad aktivitet, som raster eller passager mellan olika strukturerade aktiviteter. Svårigheten på icke-ägda platser är att balansera vuxennärvaro och vuxenfrihet, vilket skapar tillfällen för olika risksituationer. De två platser som det skadeförebyggande arbetet främst bör utgå från är *korridorer och uppehållsrum*, men det är även viktigt att finna strategier för att kunna kontrollera vem som har *tillträde till skolans lokaler.*

Den tredje delstudien framhåller vikten av att förstå platsens betydelse vid suicidala situationer. Ungdomars suicidsituationer, i motsats till äldres, utlöses ofta snabbt och impulsivt av kortvariga motgångar eller besvikelser. Suicidsituationen bör förstås som ett sätt att hantera motgångar där både tillgängliga metoder och platser är av betydelse för själva akten. Konkreta åtgärder kan vara svåra att identifiera då dessa är beroende av platsspecifika element, däremot görs i avhandlingen en fördjupad studie kring en *järnvägssträcka med två plattformar* samt en *bro*, där platsbaserade åtgärder troligen skulle kunna minska antalet suicidsituationer.

## Förslag på förebyggande åtgärder

Resultatet från avhandlingens olika delstudier ligger till grund för utvecklingen av en serie förebyggande åtgärder med grund i den fysiska miljön. I de förslag som utformas kring det förebyggande arbetet i bostadssituationer lyfts särskilt vikten av att inte begränsa risker för mycket. Även om det är centralt att skapa en säker miljö, så bör inte miljön eller utformningen av densamma begränsa de positiva effekterna av vissa riskfyllda aktiviteter. En väg för att möjliggöra balansen är att arbeta utifrån principerna om inkluderande design. Fokus ligger då på att designen ska ha en "tolerans för fel". Med detta menas att platsens utformning bör ske utifrån ett skadeförebyggande perspektiv, där lokala riskbedömningar görs samt att övergångszoner och ansvarsförhållanden klargörs för att reglera ansvarsfördelningen. Därtill är det viktigt att byggda miljön signalerar vilka aktiviteter den är avsedd för, samt att man även ser över möjligheten till en omlokalisering av vissa aktiviteter.

I skolbyggnader bör utformningen av det förebyggande arbetet ta hänsyn till och balansera tre aspekter: barn och ungdomars vardagsarbete i skolan, personalens arbetsmiljö samt den sociala organisationen i skolan. Arbetet kan genomföras genom att sektionera och organisera olika funktioner i ett rumsligt logiskt mönster. Till exempel kan klassrummet placeras nära lärarnas arbetsrum i samma korridor (*arbetszon*), följt av separata uppehållsytor (*rekreationszon*), vilket kan ge ett mer naturligt flöde i skolhuset och skapa en känsla av att platsen alltid är ägd.

Eftersom de suicidplatser som studerats i avhandlingen även används i vardagliga sammanhang är utmaningen att hitta ett sätt att arbeta med platsen utan att störa dess ursprungliga funktion. En tågstation behöver till exempel breda plattformar för att möjliggöra av- och påstigning, fast att dessa kan komma att missbrukas av ungdomar i kris som en suicidplats, främst därför att platsens utformning innebär en minskad synlighet. Det som är centralt att tänka på i ett förebyggande sammanhang är två saker. För det första att platsen har betydelse. Ökningen av suicid i samhället är ofta en effekt av ökad tillgänglighet till vissa platser eller dödliga metoder, enligt tidigare forskning. För det andra är det lätt att stigmatisera suicidplatser genom att vidta renodlat säkerhetshöjande åtgärder. Med anledning av detta är det särskilt motiverat att arbeta med platsens attraktivitet och funktionella design, dels för att öka flödet av människor på platsen på tider när den annars är övergiven, dels för att minska risken för stigmatisering.

### **Avslutande reflektioner och vidare forskning**

Även om det förebyggande arbetet utifrån förändringar av den fysiska miljön verkar lovande, framför allt när det kommer till avsiktliga skadehändelser, så bör vissa saker tas i beaktande. Bland annat är det viktigt att arbetet utformas specifikt och inte generellt. Implementeringen kräver noggranna analyser av vilka mål åtgärden har: ska den vara förebyggande eller reducera risker? Ska åtgärden rikta sig mot en speciell åldersgrupp, en speciell geografiskt avgränsad plats eller ett speciellt problem? Vikten av att vara specifik i analysen är centralt även när det kommer till utvärderingar av åtgärdernas effektivitet, och för att kunna undvika så kallade ”dark sides”. Dark sides, eller negativa konsekvenser av platsbaserade åtgärder, är främst relaterade till att miljön kan uppfattas som exkluderande, alltså att vissa åtgärder kan minska livskvalitén för vissa grupper och att vissa strategier kan bli institutionaliserade istället för att förstås som kontextspecifika processer. Det centrala är att så tidigt som möjligt ta hänsyn till vilka konsekvenser designåtgärden kan få för individer, grupper eller närområdet. Åtgärderna måste förstås som en del av det förebyggande arbetet, men inte som det enda alternativet. Förändringar i den fysiska miljön hindrar situationer och reducerar handlingsalternativ, men ändrar inte individens förutsättningar och livsvillkor. Risken är att ett för starkt fokus på miljön kan leda till exkludering eller för stort fokus på säkerhet, men det finns även en risk att det skapas en inlärdd hjälplöshet för individer – där ansvaret för handlingar och agerande reduceras. Vidare forskning bör därför arbeta med att utveckla de teoretiska ansatser och förslag som finns i avhandlingen till praktiska verktyg, och både implementeringar och utvärderingar bör då förstås och genomföras som specifika processer med ett klart fokus på vad som fungerar för vem, när och hur.

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## APPENDICES I–VI

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